

CLITORIS

The Clitoris

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CONTENTS

Chapter	Page
I Introduction	1
II Anatomy of the Human Clitoris	9
III Comparative Anatomy of the Clitoris	22
IV Neurophysiology of the Clitoris	35
V Modern Conceptions of Corpora Cavernosa Function in the Vagina and Clitoris	75
VI Cytochemistry of Clitoral Sensory Nerve Endings	87
VII Some Issues in the Histology of the Clitoris	91
VIII Pathology of the Clitoris	98
IX Surgery of the Clitoris	104
X An Anthropological View of Clitoral and other Female Genital Mutilations	111
XI Some Notes on the Etymology of the Word "Clitoris"	162
XII Reflections on the Etymology of "Clitoris" in Arabian Sexual Lore	183
XIII The Cultural Psychology of the Clitoris	191
XIV Perspectives on Anorgasmia: Toward a Female Phenomenology	224
XV Varieties of Sexual Experience	239
XVI Stereoscopic Illustrations	249
Index	253

CONTENTS

Chapter I	Introduction	1
II	History of the Human Clitoris	2
III	Comparative Anatomy of the Clitoris	3
IV	Physiology of the Clitoris	4
V	Medical Description of Clitoral Disorders	5
VI	Location in the Vagina and Clitoris	6
VII	Cytology of Clitoris and Vagina	7
VIII	Some Points in the History of the Clitoris	8
IX	Pathology of the Clitoris	9
X	Diagnosis of the Clitoris	10
XI	Anatomical Description of the Clitoris	11
XII	Female Genital Malformations	12
XIII	Some Points in the History of the Clitoris	13
XIV	"Clitoris"	14
XV	Reflections on the Physiology of Clitoris	15
XVI	Clitoral Power and	16
XVII	The Clitoral Position of the	17
XVIII	Physiology of the Clitoris	18
XIX	Physiology of the Clitoris	19
XX	Physiology of the Clitoris	20
XXI	Physiology of the Clitoris	21
XXII	Physiology of the Clitoris	22
XXIII	Physiology of the Clitoris	23
XXIV	Physiology of the Clitoris	24
XXV	Physiology of the Clitoris	25
XXVI	Physiology of the Clitoris	26
XXVII	Physiology of the Clitoris	27
XXVIII	Physiology of the Clitoris	28
XXIX	Physiology of the Clitoris	29
XXX	Physiology of the Clitoris	30

THE CLITORIS

Chapter I

INTRODUCTION

Thomas P. Lowry and Thea Snyder Lowry

The clitoris is the primary organ of sexual functioning in human females; it is clear that it has no other function than to receive and transmit sexual feelings. Ovid, the *Kama Sutra* and modern treatises on sexual functioning all acknowledge the ascendancy of the clitoris for the creation and enhancement of sexual receptivity, yet no systematic English language studies, to assemble what little knowledge exists, have been previously undertaken.

As it became increasingly clear that traditional psychoanalytic therapy for sexual disturbances in couples and/or individuals had little to offer, the new insights into sexual functioning and effective sexual therapy suggested the potential value of a collection of readings such as this. It was not a surprise to us to find that the writers who chose to define, describe and interpret female anatomy, physiology and psychology have usually been men. As men who are interested in women, and as scientists interested in natural phenomena, it is understandable that they describe their theories and investigations. It is abundantly clear to us, however, that it is inappropriate and misleading for one sex to go further than that in interpreting the psychosexuality of the opposite sex. This conviction was confirmed by a year on the staff of the Reproductive Biology Research Foundation (Masters and Johnson clinic) in St. Louis, where female therapists deal with and are the advocates for women, just as the male therapist's role is confined to advocacy for the male client.

Thus we are painfully aware of the implications of articles about women written largely by men. This imbalance was never our intent, and we regret the decisions of the four nationally-known women (a psychoanalyst, a sex educator, a family planning specialist, and a sex counselor) who, each for different reasons and at different times, declined an invitation to contribute to this book.

With the rise of feminism and the landmark appearance of publications such as *Our Bodies, Ourselves*, an end should come soon to writing about women by men. Yet gynecology textbooks prepared by men will probably continue to be used in medical schools, partly through inertia, partly through seniority and political power, and partly because the objective anatomical, biochemical, bacteriological nature of any organism is independent of the sex of the observer. Of course, the metamessage is as important as the factual content, and male bias will unavoidably show through. We hope that future gynecology textbooks will convey to students the experience of the patient, which is just as vital to comprehend as the dimension of the pelvis. We look forward to texts by female gynecologists that fully reflect both their medical expertise and experiential wisdom.

Until then, this collection of readings represents an attempt to assemble what is known, to offer possible interpretations, and to suggest areas for future research.

Since every person is simultaneously an anatomical, chemical, electrical, sociological, psychological and spiritual being, and since no one of these aspects excludes the validity of the others, we will attempt to present all this information and then to synthesize it in a way that will add to the self-knowledge and self-confirmation of women and to the understanding of men.

The book begins with the structure of the organ, perhaps the least controversial aspect of the subject, continues with physiology and concludes with the most subjective area: psychological perspectives of the clitoris, as manifested in language, myth, "beautification" rituals, and in sociological and psychiatric speculations.

In the first chapter, Donald Stilwell outlines the anatomy of the human clitoris, succinctly describing the tissues, ligaments, blood vessels and nerves which constitute and surround the clitoris.

Larry McFarland paints on the broader canvas of comparative anatomy. *Homo sapiens* is but one of thousands of species of vertebrate animals. On the evolutionary ladder, there are many rungs between turtles and birds, and human beings, yet clitorises and penes exist in almost all these creatures.

An organ may have one function early in its evolution and over the millenia change into something quite different. The muscles and cartilages that kept mud out of the lungs of the first amphibians that waded out of the primordial sea have now evolved into the larynx, which, connected to the brain, produces the immense complexity of speech. The function of the clitoris in other species is unclear; so eminent an authority as Frank Beach states that female animals probably do not experience orgasm; Kinsey's studies suggest they do, and experienced horse breeders conclude from their observations that mares are orgasmic; Suzanne Chevalier-Skolnikoff's study of the stump-tail monkey showed that the female is clearly orgasmic during both homosexual and heterosexual interaction. Breeders of other domestic animals may also have strong opinions one way or the other on the existence of orgasm in the females. Neurophysiological observations, using vaginal or rectal transducers and septal brain electrodes, will clarify these issues in the future.

Still, many non-human females apparently do *not* have orgasm. Why then do all mammalian species, and many birds and reptiles, have a clitoris, complete with nerves, muscles and blood vessels, with no known function? McFarland attempts to dispel some of the mystery by summarizing what is known about the clitoris of many familiar animal species, based on his richly varied experience in vertebrate anatomy and veterinary medicine.

The *terra incognita* of human sexual functioning, both male and female, is neurophysiology. Dr. William H. Masters has hoped to organize a neurophysiological laboratory in order to continue the work which came to a halt with the publication of *Human Sexual Response*. Pioneering work in non-human sexual neurophysiology has been done by Frank Beach in Berkeley. Robert Heath at Tulane studied a few human females during orgasm, utilizing deeply implanted brain electrodes, and A. E. Comarr, formerly with the Long Beach Veterans Administration Hospital, studied the sexual functioning of men and women with spinal cord injuries. Their beginning efforts only hint at how much more there is to learn.

Berry Campbell, who has long been interested in reproductive neurophysiology, presents the results of some original and very

valuable research. At least four points will be of interest to most readers. First, Campbell confirms Ruth Herschberger's observations that the innervation of the clitoris is similar to that of the penis, and his study of the spectrum of nerve fiber size adds neurohistological information not known before, although alluded to by Kinsey. Next, Campbell recorded and described the differential activity of four separate vulvo-vaginal muscle groups, each of which appears to play a different role in the progression of arousal and orgasm. Third, and perhaps most important, is his observation that the sexual organs exist in one of two distinct physiological states: non-aroused, when stimuli have little sexual meaning or value; and aroused, when the results of stimuli are greatly different. In the aroused state, in addition to perceiving external stimuli, the clitoris is stimulated by its own tumescence and is a source of positive feedback in the transformation of arousal into orgasm. Campbell then speculates on how engorgement with blood may change the receptivity of the specialized nerve endings. Finally, he suggests a theory of childhood negative sexual training derived from the foregoing, in which suppression of the first sensation of arousal prevents the feedback loop of arousal-tumescence-arousal from being experienced and hence the cycle is never established. This suggests a neurophysiological learning model for the primary non-orgasmic woman.

Danesino and Martella, in a pioneering and previously untranslated study, attempt to clarify the mechanism of clitoral erection. The tumescence mechanism of all erectile tissue (including the nasal mucosa) is basically one of more blood entering than leaving, but the exact mechanism for constricting the veins and dilating the arteries has long been a subject for debate. These two authors summarize previous theories, and outline the results of their careful study of the clitorises of ten women, from very young to very old.

While a nerve ending is an anatomical structure, its function is not mechanical, like a tendon, but is instead electrochemical. Giacometti and Machida studied the enzyme chemistry of seven human clitorises, and describe their findings. How to interpret the significance of their work is unclear, since the current knowledge of sexual cellular cytochemistry is so fragmentary.

In the chapter on the microscopic anatomy of the clitoris, two issues are important. First, the original work was done entirely with light microscopes, which lent relative simplicity to histology, since the fine details remained invisible. With the advent of the electron microscope, an entire cosmos of complexity has been opened. Because most medical research deals with life or death conditions, the histology of sexual perceptivity has been accorded a low priority and little new has been added recently. The second issue is how women differ from one another in the anatomy of sexual innervation. Krantz's studies provide a physical basis for the psychological imperative that each woman is the best judge of what she perceives and values. To the best of our knowledge, similar quantitative research has not been done on men.

The clitoris, like other reproductive organs, is not only vulnerable to the usual diseases and injuries, but responds to the presence or absence of sexual hormones in particular patterns. Thomas Morrione summarizes pathology in a variety of clitoral abnormalities reported in the medical literature of fifteen countries.

Since there are diseases of the clitoris, there are remedies. A. Stark Wolkoff, a gynecologist of long experience, reports on treatment methods, including freeing "clitoral adhesions," an approach long advocated by LeMon Clark. Clark recommends the dividing of clitoral-preputial adhesions as a means of enhancing female sexual response. Several colleagues (Harvey Caplan, John Binckley, William H. Masters) suggest there may be an element of suggestion in the good results, and that the psychological concepts of mild ordeal, benign permission-giving and rite of passage are perhaps the reason for the successes more than simply freeing the clitoris. Of course, in situations where hardened smegmatic material renders sexual excitement painful, that simple surgical procedure is quite useful. Wolkoff's chapter also suggests remedies for dozens of other clitoral disorders, and ends with the reasonable observation that if mystique surrounds any organ, it leads to exaggerated views and makes appropriate treatment harder to provide.

Only in the last few years have Western readers become aware

of the culturally-sanctioned modifications of the vulva that are found in some other societies. Ben Huelsman has performed a prodigious task of library research, struggled with dusty covers and yellowed pages, and assembled a very thorough discussion of ritual mutilations of the clitoris and/or vulva. Many cultural rationalizations are given for these assaults, but at least two features stand out: such surgical alterations make sexual-reproductive functioning difficult for women, and they are usually performed by women, clearly an example of survival by identifying with the oppressor. Virginia Johnson Masters has said, "Women are the great betrayers of women"; we could not agree more.

One of the reasons given for vulvar mutilation is that women would be too sexually assertive, unless literally whittled down to size. This theory is consonant with Mary Jane Sherfey's formulation that the historical suppression of women was in recognition of their capacity for unlimited multiple orgasm and the possibility of obscuring clear land titles by the production of offspring by various sires.

Huelsman describes the political struggles of Dr. Shandall of Khartoum, who has been instrumental in reducing the ferocity and number of these mutilations, but with only limited success. Though women in the Nile Valley have suffered through ritual circumcisions and infibulations since long before Cleopatra, it would be surprising if a government edict put an immediate end to this cruel and destructive procedure.

Before self-congratulation is in order, Western readers may recall that only a century ago, a London surgeon, Mr. Isaac Baker Brown, removed the clitorises of dozens of women, claiming it was a cure for insanity and epilepsy.

The internal structure of language, in both syntax and the nuances of vocabulary, tells us much about the culture of the speaker, and also shapes the thinking of that speaker, since thought is conducted in language. In the chapter on etymology, the origins of clitoral vocabulary are sketched, and an attempt is made to relate these word choices to the value system of the culture.

A similar exploration of Arabic languages by Zuhdi T. Faruki

underlines difficulties in transcultural psychology. Faruki, though highly competent in English, seems to be writing in this language while thinking in his primary culture. Although Faruki speaks highly of women, every American woman who read his contribution reported immediate negative responses to it, perceiving it as containing both simplistic and derogatory assumptions.

In the chapter on clitoral politics, I attempt to synthesize what has been written and said about the clitoris. The cultural psychology of the clitoris is an emotionally-charged subject, incorporating at least three main controversies: first, the inappropriateness of males' opinions in this area; second, the debate over "clitoral" and "vaginal" orgasm; and third, the interplay of biology and culture in sexual response.

While some of the varying opinions can be synthesized, many of them are beyond reconciliation. In these cases, Dr. Lowry has indicated which views he believes to be relevant.

Thea Snyder Lowry's chapter on the phenomenology of female sexual functioning, especially as understood through dysfunction, draws directly upon the subjective experiences of women themselves, and indicates some of the complex variety of that experience. She draws together the varied threads of child-rearing practices, anatomy, role stereotypes, parental permission and validation, and pathological experiences such as rape and incest. She reiterates that while sex may be perfectly natural, it is not always naturally perfect.

Linda Whooley and Tee Kamen, a team of highly competent group psychotherapists (whose success rate with primary non-orgasmic women is better than Masters and Johnson) discuss the great variety in female sexual patterns, illustrating their observations with personal histories contributed by ten sexually active women.

The stereoscopic views demonstrate the uniqueness of human females. In doing marital-sexual counseling, we have talked with many men who knew nothing of the location or uses of the clitoris, and with many women who did not know that they had one. Such persons might be able to gain knowledge from these illustrations, which are both photographically clear and medical-

ly appropriate. Counselors in psychology and medicine may also benefit from exposure to the variety of anatomies.

The purpose of this book is to decrease anxiety, to give space to hitherto uncollected essays on a neglected human organ, and to suggest avenues of further research. If it succeeds in any of these, we will be most gratified.

Chapter II

ANATOMY OF THE HUMAN CLITORIS

Donald L. Stilwell

INTRODUCTION

This chapter is not meant as a full review of its interesting subject, the clitoris, for there are more exhaustive and provocative sources: cf. R.L. Dickinson's *Human Sex Anatomy*. The bibliography chosen is selective both for ease and depth, whichever is desired.

External genital structures lie in the anterior half of the perineum, the urogenital triangle. They are so formed as to protect, cloak, and surround the vaginal and urethral openings, and the phallus. The vulva or *Pudendum muliebre* (*pudere*, Latin, to be ashamed; *muliebritas*, L., a womanly quality) encompasses labia majora and minora, the enclosed vestibule of the vagina, mons pubis or mons veneris (*mons*, L., mountain or elevation; *veneris*, ref. to Venus), the clitoris and its parts: glans, body, and crura; two bulbs of the vestibule, greater vestibular glands (Bartholin), and the urethral orifice.

The erectile parts of these tissues are the cavernous bulbs and clitoris, but while other vulvar tissues are not truly cavernous they secrete, swell, and congest most characteristically during sexual response. Many parts of the vulva are comparable or specifically homologous to male organs, but have adapted to vagina and vulva as a receptacle and canal for parturition. For example, the vestibular bulbs (male *corpus spongiosum*) are divided to flank the vagina, thus, do not enclose the urethra. Vascular and nervous structures are comparable: the pudendal nerve and internal pudendal vessels, pelvic splanchnic and hypogastric nerve plexuses. Deep perineal structures are comparable: anal and urogenital triangle, anorectal fossa, the urogenital diaphragm and perineal fasciae.

THE PERINEUM

Anal and urogenital regions of the perineum are divided by a line drawn just anterior to ischial tuberosities, passing across the *central tendinous point* of perineum; this corresponds to the deeper lying superficial transverse perineus muscle. Standard sources ought to be consulted for a more thorough account than can be given here. Since the vulva is related to deeper perineal structures, a fragmentary view will be offered (Fig. 1).

The *urogenital* (or genital) *triangle* corresponds in shape and location to the anterior part of the pelvic outlet; it is bounded by symphysis, ischiopubic rami, and a line between the tuberosities. A fascial and muscular sandwich, the *urogenital diaphragm*, penetrated by vagina and urethra, fills this bony triangle. External or superficial to the diaphragm lies the *superficial perineal space* (pouch), the enclosing deep fascia, superficial fascia with adiposity, and skin. Above the diaphragm lies the pelvic basin; immediately above it lie the pelvic diaphragm musculature, bladder, and upper vagina.

Skin of the perineum is for the most part labial, which corresponds to scrotum. Its adipose layer is thick where it underlies the labia majora, and peripherally it is continuous with *panniculus adiposus* (superficial fascia) of abdomen (Camper's fascia), mons pubis, and thigh. The membranous deep layer of superficial fascia is not well marked in the vulva; it continues forward with the corresponding Scarpa's fascia of abdomen. It is attached laterally to rami, and behind to the posterior margin of urogenital diaphragm.

Deep perineal fascia encloses the *superficial space* (pouch). It passes above pubis to fuse with deep fascia covering rectus sheath and external oblique muscle. Centrally it fuses with the suspensory ligament of clitoris, and behind and laterally it has the same attachments as superficial fascia, and thus limits posterior extravasations. The superficial pouch encloses three muscles and erectile bodies as in the male: *bulbospongiosus* (or bulbocavernosus) muscle covering *bulbs* of the vestibule; *ischiocavernosus* muscles enclosing *crura* of the clitoris; and the small superficial *transversus perineus* muscle. In accordance with the

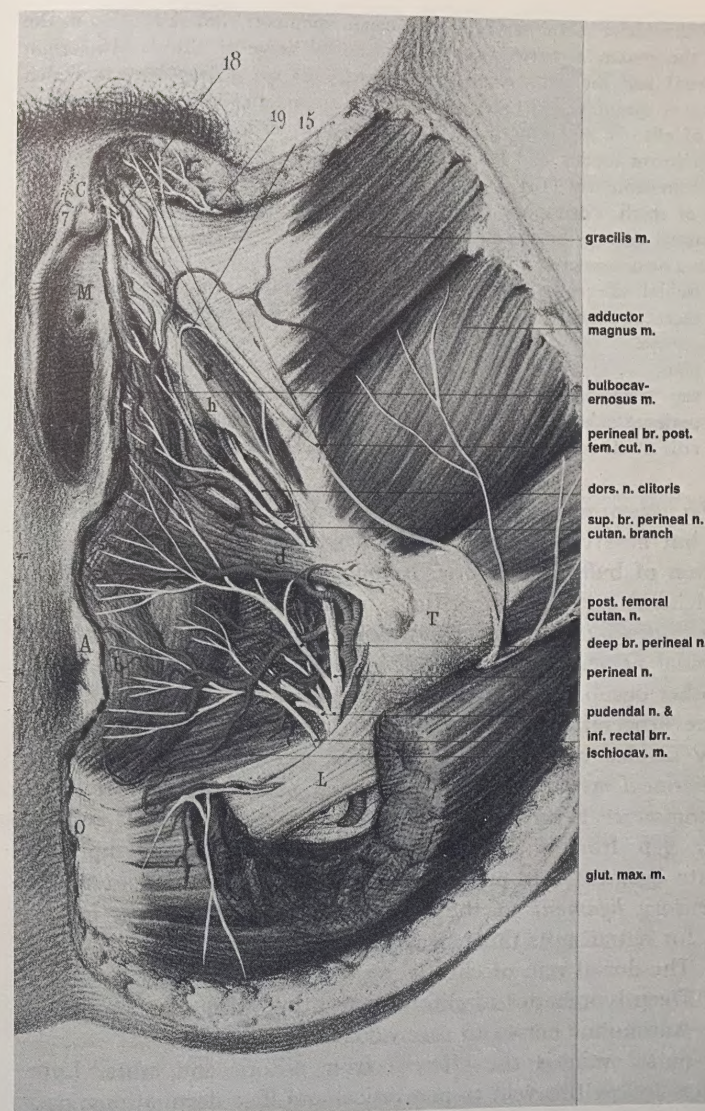


Figure 1. The pudendal (Alcock's) canal is uncovered, and lies medial to (T) the ischial tuberosity. Enclosed in fascia of the canal the pudendal nerve

gives off inferior rectal nerves to anal canal, sphincter, and skin. Also in the canal the pudendal nerve gives off the dorsal nerve of clitoris (18, origin not seen) and the perineal nerve. The last gives off a deep branch, which innervates sphincter ani externus, part of levator ani, bulbospongiosus and bulb of clitoris, and superficial transversus peronei muscle. The superficial branch forms medial and lateral labial nerves. In the illustration the lateral branch anastomoses (15) with a perineal branch of the posterior cutaneous nerve of thigh. Corresponding branches of the pudendal artery accompany like-named nerves (illustration from Savage).

Other structures indicated by letters or numbers:

T — ischial tuberosity	b — sphincter ani musc.
L — sacrotuberous lig.	M — meatus urethrae
O — coccyx	C — clitoris
A — anus	7 — prepuce
d — sup. transversus	18 — dorsal nerve of clitoris
perineus muscle	19 — ilioguinal nerve
h — crus of clitoris	15 — anastomosis of nerves

smaller *cavernous bodies* of female these muscles are less extensive, but nevertheless they function by contracting to encourage erection of bulb and clitoris. Bulbospongiosi act together feebly to tighten the vaginal orifice, from their flanking position. *Greater vestibular glands* (Bartholin), and perineal branches of pudendal nerves and deep pudendal vessels to pouch contents, are other occupants of this areolar space.

The urogenital diaphragm is penetrated by urethra, but virtually divided by the vagina. Its thick *inferior* (external) *fascia*, the *perineal membrane*, is strengthened below the symphysis as the *transverse perineal ligament*, which is separated by a millimeter gap from the *arcuate pubic ligament*. The symphysis, arcuate ligament, and pubic periosteum afford attachment to the *suspensory ligament* of the *clitoris* (Fig. 2). This gap is important, for it transmits three significant structures:

- The dorsal vein of clitoris
- Deep lymphatics of clitoris (excepting skin)
- Autonomic nerves to cavernous bodies

The dorsal vein is the efferent from clitoris and crura. Lymphatics follow this vein to paravesical and iliac destinations; only skin and glans are directed to inguinal nodes. Sympathetic and parasympathetic fibers, to vascular and erectile mechanisms, are

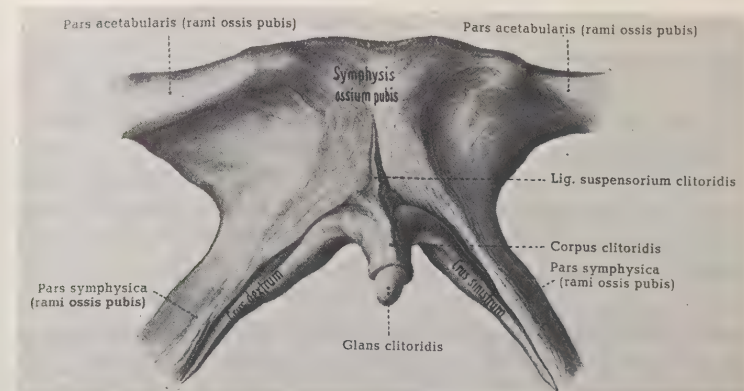


Figure 2. The relations, parts, and attachments of the clitoris are seen. (Illustration from Kopsch.)

rami of inferior hypogastric (autonomic) plexus; a fair proportion of vasomotor and vasosensory innervation follows tributaries of the dorsal vein, retrograde, to the phallus.

Superior (internal) *fascia* of the diaphragm is indistinct. The two layers meet behind to enclose the deep pouch, a thin sandwich filled with an almost inconsequential *sphincter urethrae* muscle fused to *deep transverse perineus* muscle, and perineal vessels to the bulb and adjacent tissues. Terminal perineal nerve branches and nerve to the clitoris pass in this space to pierce to their ultimate, anterior destinations. As additional functions (Fig. 1) the superior fascia supports the attachment of vestibular bulbs, Bartholin glands, crura, ischiocavernosus and bulbospongiosus muscles.

THE CAVERNOUS OR ERECTILE BODIES

These are the glans, body and crura of clitoris, and vestibular bulbs. The clitoris (*kleititoris*, Gr., not from the verb *kleitoriazein*, "to tickle") is situated at the anterior commissure of the labia majora. It is mainly cavernous vascular or erectile tissue with an enclosing sheath, formed of a small glans (L., acorn) or head, and a short body of two incompletely separated corpora cavern-

osa, continuous posteriorly with paired crura (L., legs). The clitoris is anchored via the crura to periosteum of ischiopubic rami and to the pubic symphysis and its ligaments by a *suspensory ligament*. It is the homologue of the penis, minus the male's corpus spongiosum and its enclosed spongy urethra.

Its body and head hang dependently by the suspensory ligament, a midline band a centimeter or so broad, wider at its clitoral attachment on *tunica albuginea* at the base of the body and most medial part of the crura. Recently this has been more fully described by Bertolini ('66) whose account is consistent with the degree of mobility recorded by Dickinson ('49, figure 147). This range lies from about mid-pubis to perhaps an inch below the arch during mutual pubic engagement by the sexes.

The *corpora cavernosa clitoris* are divided by an incomplete fibrous septum beginning ventrally, extending most of its length, as in the penis. The tunica albuginea is a dense fibroelastic cylinder, almost inexpandible, extending to the glans. Congestion of cavernous tissue results of course in hardening and a variable degree of elevation—erection. The anatomical concomitants of this will be dealt with in subsequent discussion.

The *glans* (head) is a cap-like summit of the clitoral body, comparatively undeveloped, cavernous and variably erectile with a thin epithelium comparable to the membrane of adjacent prepuce and vestibule: stratified squamous onto which open a few *minor vestibular glands*, which secrete mucus. Upon circumcision this epithelium may become cornified and the glands disappear.

The *prepuce*, anterior forchette of labia minora, is a fold above clitoris which may or may not shield the entire organ. The tiny *frenulum* is a minute fold of conjoined labium on its under surface. Minor lips are moist, ruddy, or pink, and are covered with stratified squamous epithelium, cornified externally. Minor vestibular gland ducts open into vestibule and urethral orifice, as well as on the inner labial surface. Sebaceous glands are common both internally and externally, but without associated hair follicles (Bloom and Fawcett, '68, Stieve, '30). Centrally labia minora are composed of loose collagenous and elastic connective tissue, with large vascular structures, venous presumably, and semi-erectile or congestive.

Size of the mature clitoris is about 2-2.5 cm. (glans and body), with crura perhaps twice that length. This varies widely within individuals, on the basis presumably of inheritance and endocrine influence. Its apparent prominence varies in accordance with development of the adjacent vulva. There is no more permanent response to excitement, autoerogenous friction, or sexual experience than for the penis. Though the skin of glans, prepuce, and labia may corrugate, hypertrophy, and congest chronically with frequent activity, cavernous tissues do not participate in reactive growth.

Readers further interested in size, excursion of position, erectility, absence, "intersex" influence, as well as a broad view of functional sex anatomy are advised to refer to an excellent and original compendium, *Human Sex Anatomy*, by Robert L. Dickinson, M.D., 1949. Gerhardt ('33) deals comprehensively with comparative anatomy, also presented in this book by L.Z. McFarland, D.V.M., Ph.D. An overall anatomical view of the human phallus is considered by Halban and Seitz ('24), Schroeder ('30), or Stieve ('30).

BLOOD VESSELS, ANATOMICAL MECHANISM OF ERECTION, AND LYMPHATICS

Arteries of the phallus derive from the internal pudendal branches of the internal iliac artery. Their paths and distribution, the arrangements and histology are too familiar to develop here fully. Von Möllendorf's *Microscopic Anatomy of Man* ('30) is the best standard source. The reader of English is referred to textbooks of histology, exemplified by Bloom and Fawcett ('68).

Vessel walls are built of a much greater proportion of smooth muscle than elsewhere, and show characteristic specializations. In the *dorsal artery* and *deep dorsal vein* of clitoris, and their branches, both circular and longitudinal muscle is to be found in unusual formations. One is penetrating *helicine* (Gr. *helix*, a coil or corkscrew) arteries, which control afferent blood and another is unusual subintimal pads and thickenings of both arterial and venous walls, consisting of longitudinally-running smooth muscle.

Tributaries of the dorsal vein are so muscular as to resemble arteries. These arrangements of valvular control of blood flow via afferent and efferent constrictions are unique in the human body, even though visceral vascular control elsewhere is monitored closely.

The deep dorsal vein of phallus does not follow the artery back to perineum and pelvis. It is a midline vessel lying with the artery and dorsal nerves on the tunica albuginea, and it begins in a plexus of the glans, receives deep tributaries from the cavernous spaces, and passes under the arcuate pubic ligament, then to divide and enter the vesical plexus to join other pelvic veins. In a small proportion of cases it may be tributary to the pudendal vein in perineum.

Injection of the deep dorsal vein of the penis (Batson, '57; Clemens, '61) introduces fluid into prostatic and vesical venous plexuses, followed by immediate flow into sacral and pelvic foramina, and free anastomosis with internal and paravertebral plexuses, ultimately into venous spaces in pelvis, vertebrae, cranial sinuses, and skull. There is rich anastomosis with vena caval and azygous systems, reversible with variance of pressure in body cavities. It is this system which so readily explains metastasis from viscera to skeletal structures in particular from pelvic origins.

The mechanism of erection in male or female involves autonomic nerves and their control of flow to and from cavernous spaces. It is believed (Conti, '52) that ingress depends on activity of parasympathetic fibers from S.2-4 (pelvic splanchnic, nervi erigentes). Relaxation of the muscular walls and helicine branches of the dorsal artery produces a distension of trabecular spaces of the cavernous bodies, and of the plexus of veins in loose, subepithelial tissues of vestibule, labia, the bulb of vestibule, as well as activity of glandular lubrication mechanisms: greater (Bartholin) and lesser vestibular glands. Egress of blood is blocked by the extraordinary pad and valvular structures in deep dorsal vein and its tributaries, which drain cavernous spaces. Sympathetic nerves arising from L.1-2 terminate the state of erection and secretion by vasoconstriction of afferent arterial channels and release of the venous mechanism.

Lymph node groups at inguinal and internal iliac locations receive afferents from perineum and the vulva. Skin of the vulva, prepuce, perineum and anus drains to *superficial inguinal nodes*, glans skin to *deep inguinal nodes*. The remainder of clitoris, plus vestibule, its bulb, lower vagina, urethra and bladder, and all but fundus of the uterus follow venous drainage to *internal iliac nodes*. This is in accordance with development of the visceral and deep structures from cloacal origin, and skin from epithelium between thighs of embryo and fetus.

DEVELOPMENT

A partial list of homologous organs is appended (Table I). Any standard gross anatomy or embryology text (e.g., Patten, '64) will serve as a fuller source of information and illustration; only a summary will serve here.

TABLE I
SOME HOMOLOGIES OF REPRODUCTIVE SYSTEM

Male	Female
no homologue	upper vagina
prostatic utricle	lower vagina
seminal colliculus	hymen
urethra below utricle	vestibule of vagina
urethra above utricle	urethra
urethral surface penis	labia minora
scrotum	labia majora
glans penis	glans clitoris
corp. cavernosum penis	corp. cavernosum clitoris
corp. spongiosum penis	bulb on vestibule
prostate gland	urethral glands
urethral glands (Littre)	minor (lesser) vestibular glands
bulbourethral gland (Cowper)	major vestibular gland (Bartholin)

In the early embryo (9 mm., 4-5 weeks) a *genital* (phallic or cloacal) *tubercle* forms over the pubic area, anterior to the proctodeum. Its tissues become epithelial portions of penis and clitoris. On the tubercle's under surface a longitudinal groove opens, the *urogenital sinus*. The groove becomes bordered by *genital folds* (future labia minora). Proctodeum (future anus) and urogenital sinus (future vagina and vestibule) are derived when

the crescentic urorectal fold subdivides cloaca (5-6 weeks) into intestinal and urogenital portions.

Lateral to tubercle and nearer thighs *genital*, or *labioscrotal swellings* develop, later becoming labia majora and scrotum. Genital folds become urethral folds to close the penile raphé, but in the female fail to close and become labia minora, enclosing the derived vestibule. The original urogenital sinus orifice retains relations as the vaginal outlet and vestibular area, only nominally different from its embryonic relationship.

Preputial skin derives from a special epithelial fold at the base of the fetal glans. The sheet of cells splits, forming the stratified squamous and mucus secreting lining of prepuce, and covering glans with a similar epithelium.

INNERVATION

The clitoris has *somatic sensory*, *somatic motor*, *visceral motor* (autonomic), and *vasosensory* components. The *pudendal nerve*, a mixed somatic nerve, and the *hypogastric autonomic plexus* serve perineum and vulvar structures.

General sensation to skin of glans, prepuce, and body passes in the pudendal nerve to lumbosacral plexus and to anterior rami of spinal nerves S.2-4, via anterior sacral foramina. Probably many vasosensory fibers are also conveyed, though most return to cord in autonomic nerves. Somatic motor fibers are conveyed to perineal muscles, arising in cord anterior gray S.2-4.

Erectile bodies have *sympathetic* and *parasympathetic* (visceral motor, autonomic), and *vasosensory* (visceral sensory) innervation, terminating profusely in the specialized smooth muscle wall of arteries and veins, and the semi-erectile blood spaces of labial and vestibular tissues. These autonomies arise from *thoracolumbar outflow* [L.1-2(3)] and *craniosacral outflow* (S.2-4) to enter the *inferior hypogastric nerve plexus*, and reach the vulva and perineum by *cavernous nerves* and the pudendal nerves.

Sympathetics arise from the lateral gray column of spinal cord [at L.1-2(3)], pass via white rami to the lumbar ganglionated chain and its lower pelvic continuation, the *hypogastric*

plexus (the presacral sympathetic nerves). It comprises a simple, bilateral plexus in whose ganglia pre- and postganglionic synapse occurs. Its coccygeal termination is often termed *ganglion impar*. Anterior to middle sacral foramina, it is joined by *pelvic splanchnic nerves* (*nervi erigenti*) of the sacral parasympathetics.

From that point below, the plexus becomes *inferior hypogastric* plexus. Its rami are distributed partly to lumbosacral plexus, but mostly to arterial branches of the internal iliac (hypogastric) artery, for pelvic and perineal destinations. Rami to uterine artery become the *uterovaginal plexus*, whose lowest fibers, now mostly *postganglionic*, pass beneath bladder, under the arcuate pubic ligament, and follow outward the incoming deep dorsal vein of the clitoris. Terminal distribution is to corpora cavernosa, bulb of the vestibule, and other perivestibular vascular walls. A large part of these nerves are vasosensory. Not all is known about the specific cord level of origin, ganglionic synapse, and the exact peripheral course of autonomic and vasosensory fibers, but the summary above is generally agreed upon.

However, it is true that all these hypogastric and sacral nerves, supplemented in part by the pudendal nerve, contain both visceral sensory and motor fibers. They are indispensable for ordinary and cord reflexes of vascular smooth muscle and glands of pelvic and reproductive organs, and for erectile functions.

The terminal portion of these autonomic nerves, as they pass under pubis, is termed cavernous nerves. They follow deep veins and arteries and their branches form an especially profuse perivascular plexus. Along their course, especially at vascular branchings, *encapsulated corpuscles* are numerous. These have heretofore been named "genital corpuscles," misleadingly implying a special sexual sensation. Their form is Pacinian, and their function is vasosensory. They correspond to the wealth of Pacinian corpuscles monitoring blood flow in mesenteries, pancreas, thyroid, digital vessels, and numerous other locations, invariably paravascular.

SENSATION

Skin sensation of labia minora, prepuce, glans, and body comprises the following modalities: pain, cold, warmth, and tactile (touch, pressure, tickle, itch, localization, etc.). The pattern of innervation is not different from glabrous (hairless) skin elsewhere. A triad of free, encapsulated (Meissner), and expanded tip (Merkel) endings, superficially modified is also found in palm, sole, and periareolar breast. All are exceedingly sensitive, and characteristic qualities are recognized, or learned, for each zone.

Free endings ramify within stratified squamous epithelia to the stratum lucidum, and in superficial dermis; they connect to smaller diameter fibers, and probably serve for touch, pain, and temperature. Larger fibers end in Meissner corpuscles and structurally similar endings in dermal papillae and dermis—confusingly called Krause or Golgi-Mazzoni corpuscles. These are all tactile, but archaic literature without basis assigns to some of them "cold, hot or pressure" functions. Merkel, or expanded tip endings, clasp the deep tips of epidermal ridges, and are assumed to subserve touch and skin movement (see: Miller, Ralston and Kasahara, '60; Cauna '58).

The mystique of a genital corpuscle is moderated by a knowledge of its vasomotor function, and that no unusual nerve supply to the vulva, other than abundance, exists. Sexual and libidinous experience is only in part related to a wealth and variety of receptors in skin. It derives also from learning, central discrimination (of kind or quality of perception), and from erotic conditioning. Engorgement greatly intensified it; therefore visceral and deep somatic receptors must be involved.

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Chapter III

COMPARATIVE ANATOMY OF THE CLITORIS

Larry Z. McFarland

This chapter was not intended to be an encyclopedic review of the structure of the clitoris for all vertebrates. Rather it is intended to be a general presentation of the clitoris stressing common anatomical features. Comments have been made on specific mammalian species, especially on certain domestic animals and non-human primates. To this end I have drawn freely upon the information presented in the encyclopedic works: *Marshall's Physiology of Reproduction* (Parkes, 1952), *Primates, Comparative Anatomy and Taxonomy* (Hill, 1955, 1962, 1966, 1970), and *The Anatomy of Domestic Animals* (Sission and Grossman, 1953). The taxonomy of animals mentioned follows *Mammals of the World* (Walker, 1968) and the anatomical terminology used follows the *Nomina Anatomica Veterinaria* (World Association of Veterinary Anatomists, 1968).

I. OCCURRENCE OF THE CLITORIS AMONG VERTEBRATES

A clitoris is found only among female amniotes, viz., reptiles, birds, and mammals. The clitoris is consistently present as a normal organ only in female mammals, where it is associated with the evolution of the cloaca into separate anal and urogenital orifices. More specifically, the penis and the clitoris are related to the development of the urogenital sinus into the penile urethra of the male or into the separate vaginal and urethral orifices of the female characteristic of the various species of mammals.

A small clitoris can be found in reptiles (e.g., turtles, alligators, and crocodiles), and in some birds (e.g., ratites and anseriforms). In these non-mammalian vertebrates the clitoris is comprised of erectile tissue similar to the corpus cavernosum.

II. GENERAL FEATURES OF THE MAMMALIAN CLITORIS

The clitoris of most mammals is comprised of paired attachments (*crura clitoridia*), a body (*corpus clitoridis*), and an exposed or free area (*glans clitoridis*). The exposed part of the clitoris is typically surrounded by a fold of skin or vestibular mucosa (*preputium clitoridis*) from which extends a *frenulum*, and in many mammals the clitoris occupies a depression (*fossa clitoridis*) in the cranioventral aspect of the vestibule or vulva.

The *corpus cavernosum clitoridis*, homologue of the *corpus cavernosum penis*, are paired muscles and are typically erectile tissue which originate from the ischial arch creating the major features of the crura and body of the clitoris. The origins of the ischiocavernosus and ischiourethralis (*M. transversus perinei superficialis*) muscles are commonly related to the crura of the clitoris. The walls of the vestibule and labia, when present, are comprised predominantly of constrictor muscles (*M. constrictor vestibuli* and *M. constrictor vulvae*), homologues of the *M. bulbocavernosus* (*M. bulbospongiosus*) of the male.

The *M. retractor clitoridis*, homologue of the *M. retractor penis*, is a prominent muscle in those mammals in which the penis is fixed to the abdominal wall (Bassett, 1961), e.g., the Australian opossum, hedgehog, rat, rabbit, cat, pig, cow and sheep, to name a few. The retractor muscle is lateral to the constrictor vestibuli muscle and may assist in tensing the vulvar orifice during copulation. For example, it has been shown that stimulation of the clitoris in mid-thoracic spinal dogs induced rhythmic contractions of the constrictor vestibuli muscle (Hart, 1970). Older work by Langley and Anderson (1895) in the female cat demonstrated that stimulation of the lumbar nerves caused slight retraction of clitoris, constriction of the vulva, and pallor of the clitoris.

Usually, the clitoris is not traversed by the urogenital canal. Among primates it is common to find the ventral surface of the clitoris grooved by the continuation of the urogenital sinus or pudendal cleft. A *clitorine urethra* is a normal structure of many rodents, of the mole, of some primates, of the spotted hyena and the elephant.

An *os clitoridis* can be found embedded in the tissue of the *corpus cavernosum clitoridis* of females of most species where an *os penis* or *baculum* commonly exists in the male. Thus an *os clitoridis* is common in most rodents and in some primates, carnivores, and cetacea.

The arterial supply to the clitoris, *A. clitoridis*, is typically derived from the internal pudendal artery. A notable exception is the mare in which a single artery, *A. clitoridis media*, is derived from the obturator of the caudal gluteal artery. The *A. clitoridis* typically divides into three branches: *A. bulbi vestibuli*, *A. profundus clitoridis*, and *A. dorsalis clitoridis*.

The venous drainages resemble the arterial supply. The vein of the clitoris, *V. clitoridis*, usually receives three veins (*V. bulbi vestibuli*, *V. profunda clitoridis*, and *V. dorsalis clitoridis*) before joining the internal pudendal vein.

The lymphatic drainage of the clitoris, at least for the domestic animals, goes to the superficial inguinal lymph nodes.

The nerve supply to the clitoris, *N. dorsalis clitoridis*, is derived from the pudendal nerve. In those animals studied, nerve terminals are reported to be especially numerous in the glans clitoridis (Trautman & Fiebiger, 1952; Winkleman, 1960). There are branched and unbranched free-nerve endings and corpuscular endings, such as Pacinian corpuscles and genital corpuscles. Furthermore, the number of nerve fibers passing in the dorsal nerve of the clitoris of the ewe and cow has been found equal to or greater than the number of fibers passing in the homologous nerve to the penis of the ram or bull (Kitchell *et al.*, 1955).

III. FUNCTION OF THE CLITORIS IN ANIMALS

The precise functional role of the clitoris in animals is unknown. Inferences can be made from various observations that the nerves of the clitoris affect the central nervous system. For example, certain mammals such as the cat and rabbit require mechanical stimulation of the clitoris, vulva and vagina in order to induce ovulation. In the practice of artificial insemination of

cattle, it is well known that touching or squeezing the clitoris will induce an immediate lordotic response which eases the anorectal pressure exerted on the arm. Stimulation of the clitoris of spinal dogs causes rhythmic contractions of the *M. constrictor vestibuli* (Hart, 1970), and stimulation of the clitoris in the ewe results in fast and slow action potentials along the dorsal roots of sacral nerves three or four (Kitchell *et al.*, 1955). The fast action potentials were believed related to striated muscle input from the vulva whereas the slow action potentials were believed related to input from the numerous genital corpuscles observed histologically in the clitoris. Cutaneous stimulation of the clitoris caused contralateral action potentials out of the ventral roots of sacral nerves three and four, which is not observed following cutaneous stimulation at other spinal segments, suggesting that stimulation of the clitoris results in bilateral activation of the lower spinal cord to discharge nerve impulses along the nerves to the structures of the perineum (Kitchell *et al.*, 1955).

IV. COMPARATIVE ASPECTS OF THE CLITORIS IN VARIOUS MAMMALS

Perissodactylia

Mare (Equus caballus). The clitoris is prominent. The glans clitoridis is an ovoid structure about 2.5 cm. wide, and lies in a distinct fossa clitoridis and is covered by a preputium. The corpus clitoridis is about 5 cm. long and 1.5 cm. in diameter, and the corpus cavernosum clitoridis is well developed with abundant musculature and a septum. The glans clitoridis is richly innervated and erectile, and the preputium clitoridis is non-glandular. As estrus approaches the labia relax allowing the rounded glans clitoridis to be seen—which is referred to as the “winking effect” associated with the breeding cycle of the mare. The labia of the mare are smooth, prominent and hairless. Large erectile vestibular bulbs are present. See Fig. 3.

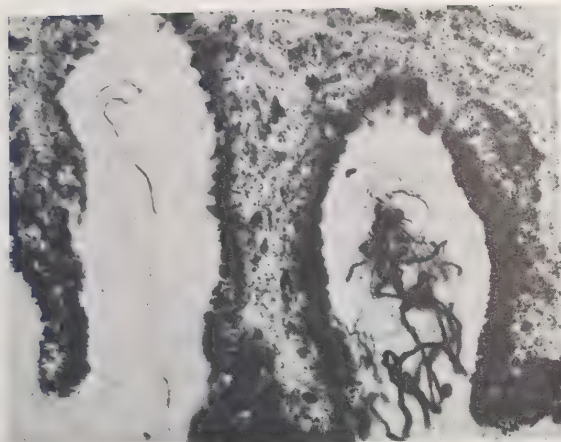


Figure 3. Encapsulated nerve endings and free nerve endings in mare clitoris. (8x)

Artiodactylia

Cow (Bos taurus). The glans clitoris is free and pointed, and the corpus clitoridis is 10-12.5 cm. long and flexuous. The fossa clitoridis is very shallow or completely absent. The glans clitoridis has a fibroelastic covering and does not contain erectile tissue. The corpus cavernosum clitoridis has varying quantities of fat cells in the trabeculae of the cavernous muscle. The skin covering the labia of the cow is wrinkled and has fine hairs scattered over it. The vestibular bulbs are prominent.

Ewe (Ovis aries). The glans clitoridis is pointed and enclosed by a prominent fossa clitoridis. The clitoris is about 2.5 cm. long and 0.5 cm. wide. The glans clitoris is erectile whereas the corpus clitoridis is mainly fibrous in nature (May, 1970). See Fig. 4.

Sow (Sus scrofa). The fossa clitoridis is about 2 cm. cranial to the ventral commissure of the vulva. The glans clitoridis is pointed and the corpus clitoridis is long and flexuous. The preputium clitoridis has numerous corpuscular endings.

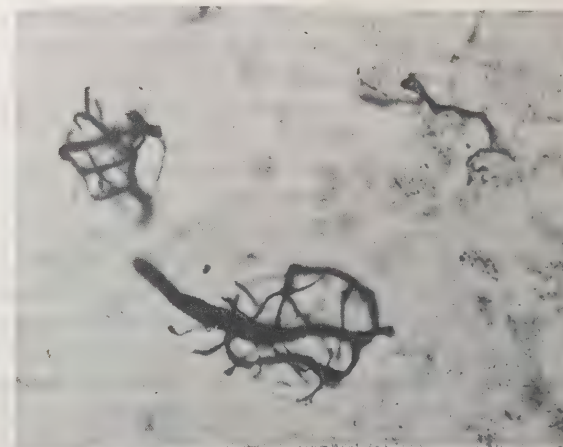


Figure 4. Genital corpuscles in the ewe clitoris.

Rodentia

Mouse (Mus). The vagina of the mouse opens independently to the exterior (as is the case in most rodents), about 0.5 cm. in front of the anus, and the vagina is not surrounded by any structure homologous to the labia minora. The glans clitoridis forms a small prominence, at times referred to as the "clitoridium," just in front of the vaginal opening and is traversed by the urethral canal. A small fossa clitoridis is present into which opens the urethra dorsally and the clitoridal glands, homologues of the preputial glands, laterally (Rugh, 1968).

Rat (Rattus). As in the case of the mouse, the vaginal orifice is separated from the urethral orifice. The clitoris is traversed by the urethra, as described for the mouse, the fossa clitoridis encloses the clitoris, but the clitoridal glands open separately on the "clitorium" and not into the fossa.

Hamster (Mesocricetus auratus). The clitoris is similar to the rat and mouse, except there is typically an os clitoridis present.

Guinea pig (Cavia porcellus). The clitoris is well developed and is traversed by the urethral canal. There is a characteristic shallow groove running from the anus to the clitoris, and it

hides the underlying structures. The groove has been referred to as the *fossa ano-vagino-urethralis*. The vagina is normally closed by a membrane except during estrus, and there is a diverticulum (perineal sac or pouch) between this membrane and the anus.

Lagomorpha

Rabbit (Oryctolagus cuniculus). The rabbit's clitoris is large, reaching a length of 3 cm. It is located inside the ventral commissure of the vulva, and the glans clitoridis has a prominent tip which projects toward the vaginal orifice. The paired corpus cavernosum clitoridis are surrounded by a thick fibrous tunic.

Carnivora

Dog (Canis familiaris). In the bitch the clitoris lies about 2-3 cm. from the ventral commissure of the vulva within a prominent fossa clitoridis, which is about 1 cm. in diameter. The glans clitoridis projects into the fossa and contains erectile tissue. The corpus cavernosum clitoridis are composed primarily of fatty tissue in the axial area, and separated by a septum, and they are enclosed by a fibrous tunic in which there are numerous vessels and nerves. An os clitoridis is not usually present.

Cat (Felis domestica). The clitoris of the queen is about 1 cm. long. The clitoris occupies a fossa clitoridis which is about 1 cm. from the ventral commissure. There is usually a cartilagenous os clitoridis located in the corpus clitoridis.

Spotted hyena (Crocuta crocuta). The urogenital canal traverses a relatively large clitoris, which in the non-parous female is almost indistinguishable from the penis of the male. The clitoridis is about 5 cm. long and 2.5 cm. in diameter near its base; it is directed downward and forward, and a prepuce covers the glans clitoridis, which is about 3 cm. long and has small spines. The clitoris is erectile; copulation, parturition, and urination take place through the urogenital canal traversing the clitoris (Matthews, 1939).

Primates

Tupaiaidae (Tree shrews). The clitoris is inconspicuous in the shrews.

Lemuridae (Lemurs). The clitoris is long and the urethral orifice is typically located at the base of the clitoris, except in the ring-tailed lemur (*L. catta*) in which the urethra traverses the clitoris. Some lemurs have not only a labia minora but also prominent labia majora. The external genitalia are often as specialized as the penis.

Lorisidae (Loris, Galago). The clitoris is long and is traversed by the urethra. An os clitoridis is present in at least one species.

Tarsiidae (Tarsiers). There is a bifid glans clitoridis concealed by large labia minora. The perineal surface of the clitoris has a median groove. During sexual turgescence the labia swell, the urogenital cleft is distended, and the glans clitoridis becomes visible as a lighter colored structure than the rest of the vulva.

Cebidae (New World monkeys). In New World monkeys the clitoris is usually quite prominent, often pendulous, and frequently resembles the penis. There is characteristically a ventromedian groove on the perineal aspect of the clitoris, a preputium, and paired frenula which continue from the edges of the groove to the labia minora bordering the rima pudendi. Catamenial swelling of the perineum (sexual skin) associated with the estrous cycle occurs in some species. An os clitoridis is present in some.

Ateles (Spider monkeys). The clitoris is large and pendulous, with a prominent ventromedian groove. There is usually a cartilagenous os clitoridis. The hook-shaped glans clitoridis is usually pigmented, is covered by a preputium, and lies in a fossa.

Alouatta (Howler monkeys). The labia minora and clitoris are elongated giving the appearance of a pendulous apron about 25 mm. square. The clitoris has a prominent ventromedian groove, and the labia majora form the borders of the apron. The entire vulva is brilliantly white, except for the blackened free borders of the labia majora. In the young female the preputium clitoridis may completely cover the clitoris creating a fossa.

Cebus (Capuchins). The clitoris is large and shaped similar to

the penis with a cylindrical corpus and tapering collum. The glans clitoridis has a flattened mushroom-head with well defined emarginate corona. The clitoris extends some 18 mm. from the symphysis; the distal half is covered with a smooth, pigmented skin whereas the proximal half has typical hairy skin. There is a shallow ventromedian groove. A small os clitoridis is present.

Lagothrix (Wooly monkeys). The clitoris is a prominent cylindrical organ almost as large as the penis. The glans is unpigmented and depending on the species may be smooth or have a marked corona. There is a ventromedian groove, and the rima pudendi is guarded by labia minora whose inner zone is unpigmented and whose outer zone is pigmented.

Callicebus (Titi monkeys). The clitoris resembles the penis, but the glans clitoridis is more elongated and has a ventromedian groove continuous with the rima pudendi.

Pithecia (Sakis). There is a prominent clitoris projecting from the ventral commissure of the labia. The glans clitoridis is rounded with a distinct neck, the preputium clitoridis extends from the labia minora, and there is a ventromedian pudendal cleft on the clitoris.

Chiropotes (Red-backed sakis). There is a large area of naked perineum with a short vulvar orifice and no distinct pendulous clitoris. In *C. Satanas* there are no labia minora or majora and within the vulva there is a widely flattened, bilobed clitoris which is darker bluish in color than the vulva.

Cacajao (Cacajaos). The glans clitoridis is unpigmented and measures 4 mm. long by 2.5 mm. wide, and there is a ventromedian groove along its perineal half. The preputium is pigmented, and the lateral labia minora are marked by a reticular formation of sulci. Labia majora flank the minora.

Saimiri (Squirrel monkeys). The clitoris is prominent and enclosed by a preputium. Catamenial swelling of the perineal skin is marked, the labia swell into hard parallel ridges some 4-6 mm. in height, and the rima pudendi becomes everted behind the base of the clitoris.

Miopithecus (Talopoin monkeys). There is a prominent glans clitoridis and ventral cleft. The glans is globular, measuring

6 mm. long by 5 mm. thick by 4.6 mm. across. Sexual skin changes are dramatic and extensive.

Erythrocebus (Patas monkeys). The glans clitoridis is globular in form, rosy red in color, and projects a little beyond the rather small vulva, whose folds suggest a labia minora and majora.

Cercopithecidae (Old World monkeys). In the Old World monkeys the clitoris varies in size, and is often inconspicuous. The organ is never perforated by the urethra, and an os clitoridis may be present in some species. The labia minora are more frequently developed than are the labia majora. Catamenial swelling (sexual skin) of the perineum often involves the ischial tuberosities, and its occurrence is irregularly distributed among Old World monkeys.

Cercopithecus (*Cercopithecus* monkeys). The clitoris is usually a bright pink to scarlet color, in contrast with the labia minora, and in the non-erect state it is usually not prominent. Under sexual excitement the clitoris becomes erect and is "presented" to an interested male. The glans is acornlike in shape and has a ventromedian groove. The corpus clitoridis is contained within a cutaneous sheath, usually pigmented, which may terminate in a crenated frill around the glans.

Presbytis (*Langurs*, etc.). The clitoris in *Semnopithecus* is conspicuous. It occupies a fossa and projects below the labia in parous and non-parous females. Its body is 5 mm. long and the ventrally grooved glans measure 4 x 3 mm. The urethra opens on a urethral papilla in front of the vagina. The rima pudendi is flanked by labia minora.

Macaca (*Rhesus* monkeys, etc.). The clitoris is rather large and has a shallow cleft on its ventral surface. The preputium continues with the small labia minora. Labia majora are absent.

Papio (*Baboons*). The labia are well defined and ensheath a relatively large clitoris. The glans clitoridis is a rosy red, bulbous body with a ventral cleft. The perineum of baboons undergoes remarkable catamenial swelling, and in some species the preputium clitoridis enlarges into a pendulous lobe.

Mandrillus (*Mandrills*). The rima pudendi is not flanked by

distinct labia. The prominent clitoris is guarded by a hoodlike, wrinkled preputium, and projects well beyond the ventral commissure of the rima pudendi. The glans is about 7 mm. long and resembles the male glans except its apex is deeply cleft. During the sexual cycle the perineal skin is markedly swollen and a rosy color; the swelling extends to the clitoris.

Pongidae (*Gibbon, orang, chimpanzee, gorilla*). The clitoris and the labia minora are generally well developed, especially in the chimpanzee and some gibbons. The clitoris is both absolutely as well as relatively larger in these anthropoid apes than in woman. The clitoris lies in a fossa and is covered by a preputium from which passes a prominent frenulum. The clitoris is grooved on its ventromedial surface, and this becomes very conspicuous when the clitoris is everted. Catamenial swelling of the perineum is noted in the chimpanzee and to a lesser degree in the gorilla and the orang. No sexual skin is present in the gibbon.

Sirenia

Dugong. The glans clitoridis is round and conspicuous and is situated cranial to the urethral orifice. The vagina opens in a shallow perineal groove, similar to that described for the guinea pig.

Cetacea

Whale. There is a vulvar cleft, the cranial commissure of which encloses the clitoris. The clitoris is an incurved, keeled structure about 8 cm. long. The glans clitoridis is trilobed and directed caudad. The urethra opens at the base of the clitoris.

Proboscidae

African elephant (Loxodonta africanus). The external genitalia of the female elephant are carried ventral from the perineal region to open along the abdominal wall at a position similar to that of the tip of the penis. This creates a very elongated uro-

genital canal and clitoris, whose length is proportional. Thus the external genitalia of the male and female are superficially similar. The urogenital canal is thinwalled with a large lumen. There is little cavernous tissue in the corpus clitoridis, which forms the roof of the urogenital sinus. The corpora cavernosa clitoridis are prominent and run from ischial arch to the glans. A median tendon to which attaches the *M. retractor clitoridis* is incorporated into the elastic sheath of the corpora clitoridis and it continues to the tip of the glans. The glans clitoridis is erectile, and well innervated, and projects about 2.5 cm. from the cranial commissure of the vulva (Perry, 1964).

Insectivora

In the mole (*Talpa*) the external genitalia of male and female are very similar except during the breeding season. An anogenital distance of less than 6 mm. is a presumptive female. The clitoris is traversed by the urethra and the glans clitoridis contains small spines.

Monotremata

The clitoris is a vestigial to nonexistent structure associated with the primitive reptilian-like cloaca present in female monotremes.

Marsupialia

The clitoris of the more primitive marsupials, e.g., the virginia opossum and phalangiers, has a bifid structure similar to that of the penis. Kangaroos and wallabys have a cylindrical clitoris.

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Chapter IV

NEUROPHYSIOLOGY OF THE CLITORIS

Berry Campbell

INTRODUCTION

A discussion of the neurophysiology of the clitoris must bring together diverse and scattered data. Little of the literature dealing with this subject and its role in sexual behavior has centered around the functions involving the clitoris, *per se*, or the associated physiological and behavioral entities. Rather we find that this tiny but impressive organ is given a subsidiary billing in the varied literature of sexual function. Exceptions to this situation are to be seen in the works of Masters and Johnson (1) who correctly assess its importance in the female sexual response and in the interesting analysis of Sherfey (2) who considers the ontogeny of the clitoral function.

In the ensuing pages, I will attempt to bring the neurophysiological literature of the clitoris into a clearer focus, to present some original data related to sensory conduction from this organ, to integrate clitoral function into the current concepts of behavior, and finally, to proffer new hypotheses on the importance of arousal state in the sensory function of the clitoris and the operation of positive feedback in sexual activation. The diverse roles of the varied perineal muscle groups in the female sexual response will be detailed.

As all others who have covered this ground before, I am impressed with the neglect, which the literature evidences, of this organ. Its emergence in the modern literature is obviously related to the "sexual revolution" so widely advertised in the current scene. Sherfey, more than any other writer, shows the relevance of such a protean social force as the subjugation of women to the current paucity of scientific understanding in this area. With a viewpoint clearly feminist, she argues in an impressive and engaging way, not for the equality of the female, but

for the essential superiority of the female sex. On the basis of current embryology that the male is a modified female, differentiated during the first trimester of pregnancy from the main (some morphologists use the term "indifferent") sex by the action of fetal male hormone, she arrives at a view of the natural superiority of women from grounds somewhat different from those of Ashley Montagu (3). I will not get directly involved in the discussion as to whether female sexuality has a mirror image relation to maleness (Oliver Wendell Holmes amusingly claimed that the female genitalia were but those of the male turned inside out). The reader is referred to the analysis of Beach (4). Yet, the ensuing report was prepared very much with Sherfey's interesting views in mind and some of the interpretations may bear on her thesis.

As with the paucity of literature (before the immediate present) on the female sexual response, the clitoris may owe much of its neglect to the widespread view that the organ has little or no importance in reproduction. Were this true, the current appreciation of sex as an entity separate from reproduction and important in its own right would tend to correct this disregard. In addition, we may well wonder if the role of the clitoris in reproductive function, though not essential, may play an important part. Though I have no novel views on this subject, it seems worthwhile to note the importance of genital stimulation in those animals that ovulate as a result of coitus (Sawyer, 5). As a species, man may have some residue of this pattern. Lactation in the human female is definitely affected by genital stimulation as I have reported earlier (Campbell and Petersen, 6).

The importance of learning processes in sexual functions would seem at first consideration to be slight. I should, however, point out that while the impact of learned behavior on female sexuality is more poorly understood than its similar role in the male, the dynamic views of behavior, in which ontogeny merits consideration, offer many aspects where learned behavior could be of great importance. Some mention will be made of this in the summing up.

SENSORY PATHWAYS FROM THE CLITORIS

The neurophysiology of sensory function, especially as related to sensory endings in the skin and pressure receptors of deeper tissues, has been a difficult and disputatious subject for many years. There has been a conspicuous lack of progress in the attempt to relate modality of sensations to specific types of receptors in the various areas of the skin (Weddell, 7). A review of the extensive literature of this field would be out of place. I will, however, present a generalized view based on various published works which can serve as a unifying scheme and which allows an analysis of the sensory conduction from the genitalia.

Table II presents a generalization of the inter-relations of type of nerve endings, fiber size, speed of conduction and modality. In spite of the fact that there is little agreement among various investigators on the correspondence of the smaller end-organs to the modalities of pain (in its several varieties), to temperature discrimination and to light touch, there is considerable confidence in the correlation of pressure sensations with the encapsulated end-organs as indicated in the middle and large fiber parts of this spectrum. The so-called genital corpuscles which are found in such profusion in the clitoris furnished the starting point for a study of the sensory functions of the genitalia which I conducted, some years ago, with my colleagues, Ralph Kitchell, Andrew Quilliam and Lester Larson. The following account will review some of the published data from this study (8) and also some hitherto unpublished material (Table III).

Fiber Size Spectrum Studies of the Nerves to the Genitalia. The conspicuous concentration of medium sized encapsulated end-organs in the clitoris is reflected in the fiber size spectrum of the innervation of that organ. In general, there is a correlation of the diameter of the myelinated fiber supplying a sensory end-organ with the size of the end-organ, its modality, and the speed of conduction of the fiber. The pain-temperature-light touch system is related to the small fiber component of peripheral nerves and to simple end-organs; pressure and genital sense are mediated by encapsulated end-organs and innervated by large fibers; deeper pressure and muscle sense are detected by

very large end-organs which are served by large fibers; deeper pressure and muscle sense are detected by very large end-organs which are served by the large myelinated fibers. In all classes, the speed of conduction of the fiber is related directly to fiber diameter.

A study of the fiber size spectra of the nerves of the pelvic plexus was undertaken by the author and his co-workers, R.L. Kitchell, T.A. Quilliam and L.L. Larson. The nerves of the pudendal plexus was dissected from male and female sheep and stained with a variant of the Pal-Weigert technique and sectioned. The sections were photographed at a standard enlargement and the fiber size spectra measured with appropriate rings on a plastic sheet and counted with an electronic counter. From this emerged the pattern of fiber size spectra of the innervation of the genitalia (Table III). Out of this large amount of data (previously unpublished) the most relevant items have been expressed as histograms in Fig. 5.

The pudendal nerve (Fig. 5d) shows a fiber size distribution of its 15,514 fibers which is rather typical of peripheral nerves

TABLE II

Animal No.-Sex	Nerve	Total	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22
153-M	Prox. Cutaneous Br. Pudendal N.	784	18	39	94	104	149	121	100	64	52	26	17
153	Prox. Left Perineal N.	784	18	39	94	104	149	121	100	64	52	26	17
153	Right Superficial Perineal N.	294	5	7	22	66	76	25	29	37	24	3	0
153	Right Dorsal N. to Penis	2,248	23	89	332	295	95	103	259	534	457	60	1
153	Left Dorsal N. to Penis & Glands	1,331	32	108	180	181	53	61	254	321	133	8	0
153	Prox. Branch Pudendal N.	7,870	89	238	795	2,668	2,013	674	519	358	359	157	0
153	Anast. Branch of Sciatic & Pudendal Nerve	2,437	64	123	219	418	342	331	298	291	233	99	19
153	5th Sacral Root of Pudendal N.	3,987	69	264	797	957	863	389	229	157	115	98	49
153	Deep Perineal Br. of Pudendal N.	1,611	29	94	194	216	234	201	256	173	141	59	14
167-F	Left Distal Cutaneous Br. (from S4 also)	5,428	31	71	363	2,381	1,153	519	312	179	223	165	31
167	Left Caudal Hemorrh. Branch	1,061	8	47	124	336	198	84	61	48	59	68	28

Schemata showing relationships of sensory modalities to size of end-organs and to diameter and speed of conduction of sensory fibers.

TABLE III

MODALITY	pain temp light touch	light pressure	deep pressure
SIZE OF ENDING	small (free nerve ending)	medium (encapsulated)	large (Pacinian corp) (muscle spindle)
SPEED OF CONDUCTION	slow 1-2 m/sec	medium 40-60 m/sec	fast 100 m/sec
	Fiber size (μ)		

Fiber counts by diameter classes of the nerves of the pelvic plexus of a male (#154) and a female (#183) sheep. This data, previously unpublished, is from a study made at the University of Minnesota by the author and his colleagues, Kitchell, Quilliam and Larson.

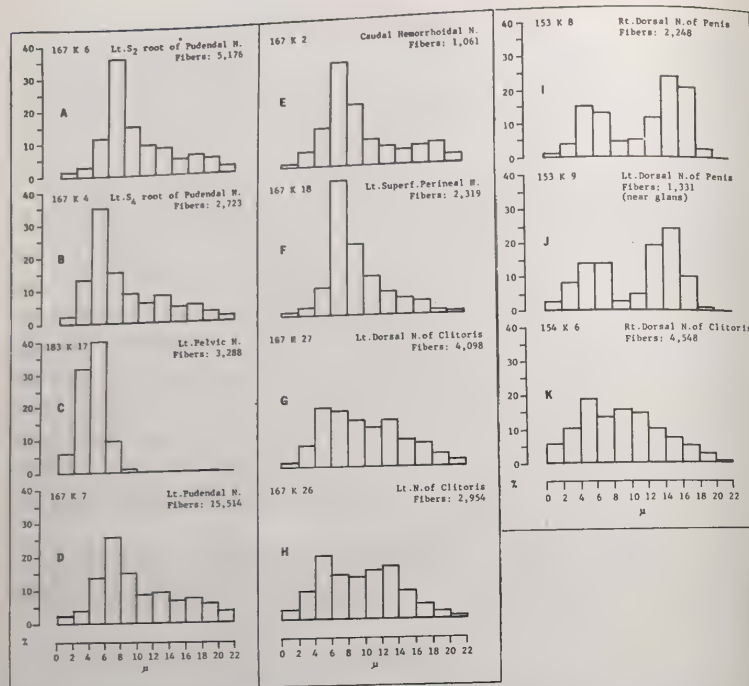


Figure 5. Histograms delineating fiber size spectra (as percentages) of selected nerves of the pelvic plexus of sheep. Some of the data is from Table 11, however, additional data is included from two additional animals, #183, male and #154, female.

except for the abundance of fibers in the 12-14, 14-16 micron classes. In comparison, a nearly pure cutaneous branch, the superficial perineal nerve (Fig. 5f) shows more prominently the peak centering at 6-8 microns which characterizes general cutaneous sensibility and shows lower percentage frequency of the fibers in the 10+ micron classes. These latter correspond to the genital innervation, Pacinian corpuscles, muscle afferents and the alpha muscle efferents. In contrast, the caudal hemorrhoidal branch (Fig. 5e), which is motor to the anal sphincter as well as cutaneous sensory, shows a prominence at 16-20 microns which is related to striated muscle, motor and sensory. At the lower end of the spectrum, the contribution of the autonomic fibers is

made clear by the skewed peak of the autonomic branch of the pudendal nerve, the pelvic nerve or nervus erigens. Many of these very small fibers enter the pudendal nerve via the fourth sacral root though undoubtedly the greatest bulk of them enter through a third sacral root. The pelvic nerve is given off as a branch of the pudendal nerve close to its origin. It contains principally the parasympathetic efferent fibers to the clitoris and the perineum generally.

The nerve to the clitoris (Fig. 5, g and k) is distinctive in that the general cutaneous component at 6-8 microns is minimized, the 4-6 micron class is substantial, the mid-region (8-12 microns) is prominent, and there is no conspicuous peak at 18-20 microns. Thus, we find in two animals (no. 167, no. 154) general agreement in the fiber size histograms of the dorsal nerve to the clitoris, each showing more than 4,000 countable fibers. It will be understood that these figures refer to one-half of the specific innervation of the organs only.

Meaningful comparisons of the nerve to the clitoris should be made with the corresponding nerve in the male sheep. The dorsal nerve to the penis (Fig. 5, i and j) shows the distribution of diameters of the fibers of this nerve near the base of the penis, and near the glans, respectively. The more proximal section yielded over 2,000 countable fibers, considerably fewer than in the nerves to the clitoris. Some of this might be due to lack of strict correspondence of the nerve sections in the male and female specimens, if that were possible. It may more probably indicate that the innervation of the penis is less than that of the clitoris for it agrees with our published findings in the bovine species (loc. cit.), where the comparable figures were 4,033 (total of both sides) in the male to 7,733 in the female.

Spinal Reflexology of the Genitalia. Conduction of impulses from the clitoris and neighboring regions of the vestibule to the spinal roots of the second, third and fourth sacral roots has been explored in cats (Campbell, Good and Kitchell, 9) and sheep (Kitchell *et al.*, loc. cit.). Bipolar stimulating electrodes in the region of the clitoris stimulated the end-organs with single condenser discharges and the conducted potentials were photographed, as they were led off from the spinal roots, on a cath-

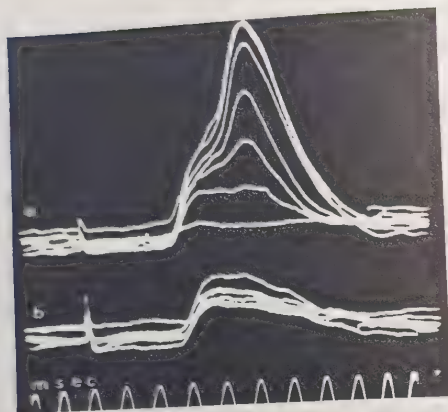


Figure 6. Different characteristics of action potentials in dorsal root of S-3 of the ewe resulting from stimulation of the clitoris: *a.* as compared to stimulation of wall of vulva. *b.* The traces are superimposed by multiple exposure during a train of stimuli of increasing strength until maximal response is obtained.

ode ray oscilloscope. A search was made for a component of the compound action potential corresponding to the intermediate mode of the fiber size spectrum so characteristic of the nerve to the clitoris. Figure 6 shows that such a correspondence does exist in a wave of intermediate velocity and threshold. The illustration is of a set of recordings from a female sheep in which the third and fourth sacral roots showed response to clitoral stimulation, the third showing the most. When the stimulus was confined to the clitoris, two separate waves were evoked, the first arising in response to a weaker shock strength than the second. This recording demonstrates the evolution of the compound action potential on the third sacral root in response to the application of a series of increasingly stronger stimuli to the clitoris. The first peak develops early and shows little increase with subsequent increase in stimulus strength. The second peak, on the other hand, showed a higher threshold in that it became maximal only with considerably greater stimulus strength than the first wave. Its delay in reaching the spinal root indicates that the fibers involved are more slowly conducting than those concerned with the earlier wave. In another such experiment, the

velocity of the first component was calculated as 110 meters/second while that for the second component was determined at 50 meters/second. Moving the stimulating electrodes to the mucosa of the lateral wall of the introitus results in a loss of the second component with no diminution of the first. From these facts we can interpret the second component as representing conduction along the fiber size mode related to the encapsulated nerve endings in the clitoris, the first component as the conduction on the fibers afferent and efferent to striated muscle.

The transmission of activity through the spinal cord shows features which distinguish those levels mediating sexual reflexes (S-3 to S-5) from the more cranial segments (L-5 to S-2) which are concerned principally with locomotion. The most striking feature is the presence of crossed reflexes and the lack of a primary proprioceptive spike. It is a universal finding that single shock stimulations of nerves of the lumbosacral plexus do not evoke a reflex response in the contralateral ventral roots. The midline of the spinal cord seems to serve as an effective barrier to the spread of simple reflex activity. However, the third and fourth sacral segments, those which are related to the genitalia, show marked crossed-reflex activity. A single shock applied to the S-3 dorsal root (Fig. 7c) results in a reflex return on the S-3 ventral root of the same side (ipsilateral) after slightly more than 3 milliseconds. This resembles the reflex of the same ventral root in response to stimulation of the vulva (Fig. 16b) with due allowance of conduction time from that organ (approximately 9 milliseconds). The comparable reflex on the contralateral S-3 ventral root (Fig. 7d), in response to dorsal root stimulation, also resembles the ipsilateral response except that there is nearly double the central latency and a slightly smaller amplitude. The reflex returns of the S-4 segment are usually similar to those found in S-3. The third and fourth sacral segments also demonstrate interaction with neighboring segments (Fig. 7, c and g) both in relation to crossed and uncrossed reflexes.

These reflexes contrast sharply with those of the second sacral segment (Fig. 8), not only in the involvement of crossed pathways within the spinal cord but also in the absence of the proprioceptive spike. In the locomotor portions of the spinal

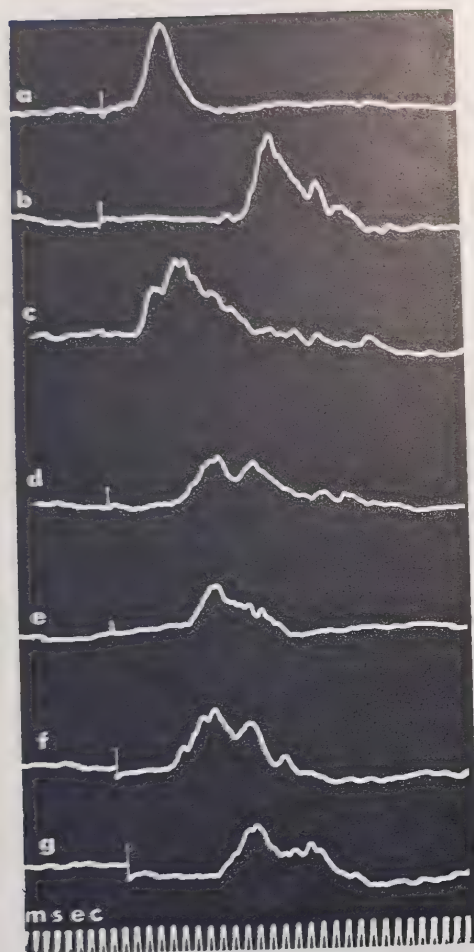


Figure 7. Responses of sacral segments of spinal cord of the ewe: *a.* S-3 dorsal root from stimulation of vulva. *b.* S-3 ventral root from stimulation of vulva. *c.* S-3 ventral root from stimulation of ipsilateral S-3 dorsal root. *d.* S-3 ventral root from stimulation of contralateral S-3 dorsal root. *e.* S-4 ventral root from stimulation of ipsilateral S-3 dorsal root. *f.* S-3 ventral root from stimulation of ipsilateral S-2 dorsal root. *g.* S-3 ventral root from stimulation of contralateral S-2 dorsal root.

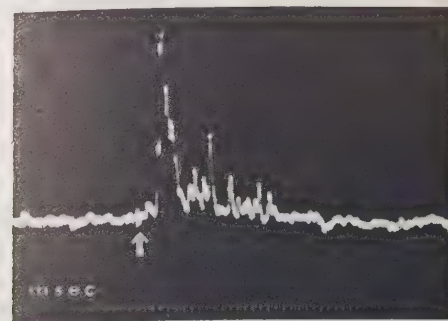


Figure 8. Response on ventral root, second segment, following stimulation of its ipsilateral dorsal root. The arrow marks the location of the indistinct shock stimulus artifact.

cord, which include the S-2 segment, the segmental reflex is dominated by the very rapid response of the motor neurons to the muscle afferents. This produces a rapid and highly synchronized spike representing the response to muscle afferents from striated muscle innervated by these segments. Thus the early afferent spike of the compound action potential of the pudendal nerve described above seems inadequate to initiate a fast response in the motor neurons. During the heightened excitability due to repetitive stimulation, an early ipsilateral component was seen in the S-3 and S-4 segmental reflex which undoubtedly represents a proprioceptive mechanism (Fig. 9, *a* and *b*). In a few of the experiments, a definite proprioceptive spike was present in the reflexes from the fourth sacral segment (Fig. 9*c*). This was a constant finding in reflexes involving the fifth sacral segment (Fig. 9*d*).

The neurophysiological phenomena seen in the cat and sheep indicate a special central pattern of activity in the segments mediating the functions of the sexual organs. The presence of the crossed reflex is associated with the synchronous activity of the motor elements of the genitalia in contrast to those mediating the alternating action of the limbs. Correlated also with the obvious differences in patterns of function between these two systems, the limbs and the genitalia, is the relative preponder-

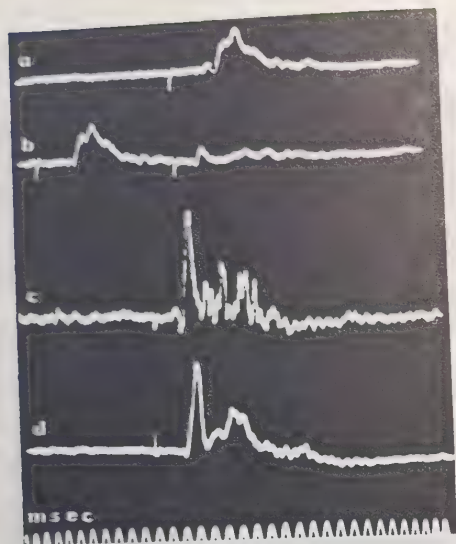


Figure 9. Responses of sacral segments of spinal cord of the ewe: *a.* S-3 ventral root from stimulation of ipsilateral S-3 dorsal root. *b.* S-3 ventral root from repetitive stimulation of ipsilateral S-3 dorsal root — note presence of an early component in the second response. *c.* S-4 ventral root from stimulation of ipsilateral S-4 dorsal root. *d.* S-5 ventral root from stimulation of ipsilateral S-5 dorsal root.

ance of the proprioceptive spike in the former and its lack in the latter. It would appear that cutaneous afferents form the driving force in the reflexes of the genitalia, a finding well in accord with observations made on copulatory behavior.

Conductory Pathways to the Brain. The interaction of higher centers with the spinal-integrated fractions of sexual behavior involves, among other things, ascending pathways in the spinal cord and brainstem. The pathways of sexual stimuli from the genitalia have been discussed with regard to the anatomy of the end-organs, fiber size spectra of the peripheral nerves, patterns of primary sensory stimuli, and reactions in the third and fourth sacral segments. The present section details the results of an experimental study in the cat of the sensory pathways from the genitalia to the diencephalon and the cerebral cortex. Some of

this material has been previously reported (Meyer *et al.*, 10). Specifically "sexual" stimuli have not been used, except inasmuch as the genitalia and the pudendal nerve were stimulated. The pathways activated were thus not necessarily the ones which transmit stimuli of sexual sign especially, but we may expect that they are the ones which form the most direct and rapid pathways for sensation from the genitalia. In the data presented here we have attempted to delineate the routes, the conduction speeds, and the patterns of the ascending signal and the reactions of the higher centers to these. The several preliminary experiments which were included in this series designed to observe the difference in these pathways between estrous and anestrous female cats were failures and the hormonal potentiation of the specifically sexual signal in these conduction routes will have to be examined more carefully without the limitations of barbiturate anesthesia.*

The cats used in this study were anesthetized with Dial or Nembutal. After surgery in which the spinal cord, cerebral cortex, or brainstem were exposed, the biopotentials were studied with a cathode ray oscilloscope. Recording electrodes were made of glass capillaries drawn while filled with a silver solder. These varied in diameter from 25 μ to 7 μ . They were mounted on a 3-way vernier electrode holder. All recordings were made of potential differences at the microelectrode against a large "indifferent" electrode on nearby inactive tissue. A 3-channel stimulator was used which delivered condenser discharges with time constants of 0.01 to 0.1 milliseconds. Histological studies were made in eight experiments and the positions of the needle tracks were determined. In two of these experiments, needle positions for critical potentials were marked by electrolytic lesions and later localized in the stained sections.

Stimuli were delivered to two sites for the genital stimulation. With silver wire bipolar electrodes, they were led across the glans

*A recent study by Kawakami and Kubo (*Neuroendocrinology*, 7:65-89, 1971) has elegantly shown with cellular recording in the brainstem, hypothalamus and limbic lobe that estrous animals show a heightened response to stimuli delivered to the vagina. The priming estrogen may act on the higher centers directly or, less likely, only by facilitating the sensitivity of the genital end-organs.

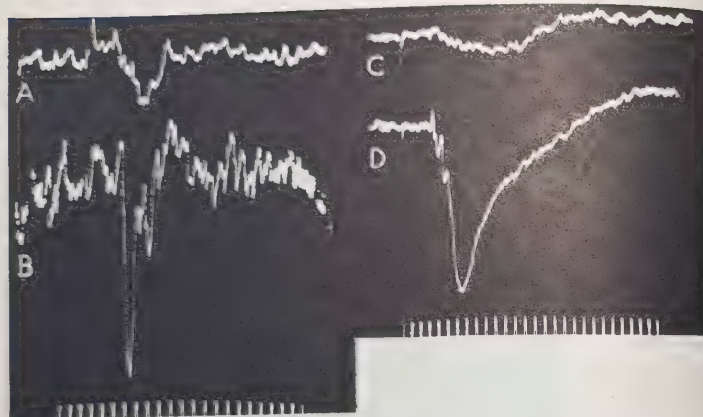


Figure 10. Recordings from: *a.* dorsal rootlets, S-3; stimulation, penis. *b.* dorsal rootlets, S-3, stimulation, tibial nerve. *c.* dorsum of cord, S-1; stimulation, penis. *d.* dorsum of cord, S-1; stimulation, tibial nerve. Time, 1 msec.

penis or, in the female cats, to the vulva in the region of the glans clitoris. In other experiments, the stimuli were delivered to the central end of the cut pudendal nerve. In all experiments, the tibial nerve at the popliteal space was sectioned and similarly stimulated for comparison.

The Spinal Cord. The effectiveness of the direct stimulation of the genitalia was determined by examining the activity in the corresponding S-3 dorsal rootlets following single shock stimulation. Figure 10 illustrates the deflections evoked by stimulation of the penis and of the tibial nerve. There are constant differences between the potentials evoked by stimulation of the genitalia directly or by stimulation of the central cut end of the pudendal nerve, on the one hand, and the potentials evoked by tibial nerve stimulation, on the other hand. The pudendal nerve field apparently is deficient in the fast conduction receptor fibers and the resulting potentials at the dorsal rootlets are delayed and show a less abrupt commencement. The amplitude also as compared with the corresponding tibial nerve potentials is low. Thus the signal delivered by the compound action potential to the spinal cord differs in the case of the pudendal

nerve pathway from that of the tibial nerve. The lower amplitude and less abrupt onset is seen in the activity within the spinal cord in the dorsal column of the local segments (contrast *c* and *d*, Fig. 10). It is seen as well in the dorsal column records at the C_1 segment (contrast Fig. 11, *a* and *b* with Fig. 11, *c*) which show the corresponding differences in the central effects.

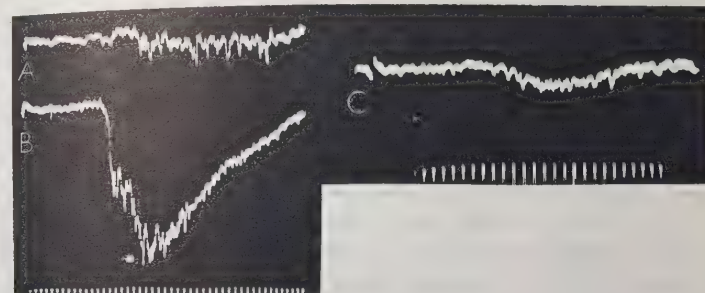


Figure 11. Recordings from dorsal column at C_1 : *a.* stimulation, pudendal nerve. *b.* stimulation, penis. *c.* stimulation, tibial nerve. Time, 1 msec.

Latency measurements and conduction distances as seen in these experiments show that the average conduction velocity in the pudendal nerve is 39 meters/second, and in the tibial nerve is 68 meters/second.

Direct conduction in the dorsal column at the C_1 level was obtained a number of times in experiments. Representative traces of the activity are shown in Fig. 11. The average conduction velocity from the pudendal nerve field is 41 meters/second, and in the tibial field is 53 meters/second. Indirect or relayed activity from the genitalia, and the tibial field as well, was recorded and measured in the lateral column. On the ipsilateral side, activity of the dorsal spinocerebellar pathway was clocked at the high conduction velocities characteristic of this pathway. From the data of these experiments, actual velocities within the spinal cord can be calculated in the one animal where in response to stimulation of the clitoris and the tibial nerve, activity was recorded in the ipsilateral column at the C_1 segment (one pudendal nerve had previously been sectioned). Correcting for the peripheral conduction latencies and for the measured dis-

tances allowing 0.9 millisecond for synaptic delay, the velocities within the contralateral column for pudendal and tibial activity may be calculated at 70 meters/second and 130 meters/second respectively. These are to be compared with dorsal column conduction velocities obtained in this animal in a like manner, of 41 and 53 meters/second. Such values in the instance of the tibial nerve lie within the velocities reported by Grundfest and Campbell (11). The slower velocity of the dorsal column fibers serving the pudendal nerve has been detailed above. It is remarkable that the calculated velocity of the conducted activity within the spinal cord, presumably mostly on the secondary tract, is so much slower than that from the tibial nerve field.

Our records of activity in the contralateral column show average conduction velocity and variation of 34 meters/second (30-35 meters/second) for the pudendal nerve activity and 48 meters/second (43-61 meters/second) for the tibial nerve records. This is significantly faster than the conduction velocities reported by Collins and Randt (12) in the cat but slower than the figures presented by Correa and Grundfest (13) for tract conduction in this region of the spinal cord of the monkey. The reason for this discrepancy with the published data is not apparent, though it is likely that our experiments were not exactly comparable to those of the previous authors. The rather wide difference between the conduction velocity which we have measured for the activity evoked by pudendal nerve (or genitalia) stimulation and that following stimuli to the tibial nerve, is in agreement with the observations presented above concerning the differences in velocity of these two systems in the dorsal column in the ipsilateral column.

The Brainstem. In order to place the electrode into the brainstem or diencephalon the cerebrum was removed, exposing the rostral portion of the thalamus and the third ventricle. Various sites for penetrating these structures were selected as illustrated in Fig. 12. Not all sites were used in each animal. The stations (indicated by open circles for genital fields, closed circles for tibial nerve) are numbered from dorsal to ventral. Each station was obtained by measuring the depth of the electrode where a recording was elicited. On the assumption that the brain size

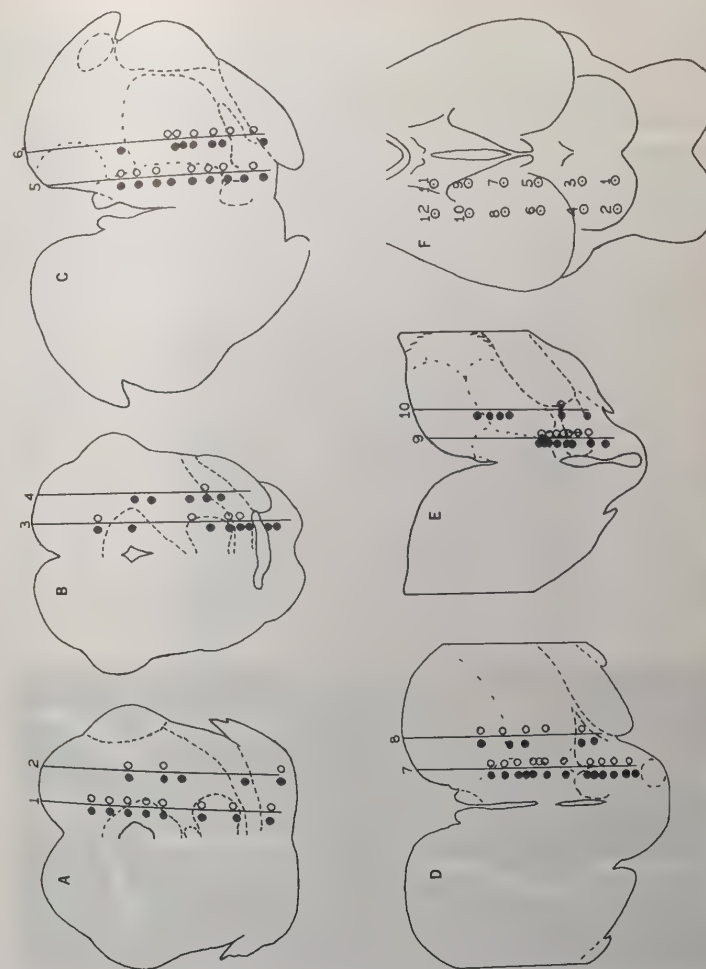


Figure 12. Cross-sections, a-e, of brainstem of the cat showing stations from which potentials were recorded by micro-electrodes. The closed circles signify sites of recording following tibial nerve stimulation, the open circles pudendal nerve field stimulation. f. The position of the tracks projected to the dorsal surface of the brainstem.

remained relatively constant, these depths were located on an appropriately scaled cross-sectional diagram. In two animals, lesions were made at each active position. The actual positions of these two lesions agreed closely with their recorded depths. This was evidence that our measurement method of determining the location of each station was fairly accurate. There was, however, a degree of uncertainty associated with the exact location of each tract because the electrode could not be placed in precisely the comparable site from one animal to another and the angle at which the electrode entered the tissue could not be exactly controlled.

The lemnisci were encountered in the ventrolateral tegmentum and recognized by the short latency and characteristic envelope. Figure 13 illustrates two pairs of potentials, evoked by stimulation of the pudendal nerve (upper traces) and of the tibial nerve (lower traces). Amplitude of the potentials, as in the spinal cord, was lower and the latencies longer in the responses to pudendal nerve stimulation. The deflections were positive as is characteristic of pure tract potentials and it is seen that the onset of positivity (shown as "drop off" in the traces) is more abrupt in the potentials evoked by tibial nerve stimulation.

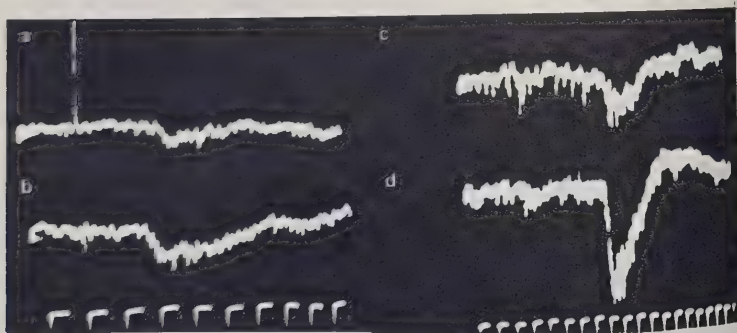


Figure 13. Recordings from lemniscus at level of superior colliculus: *a.* stimulation, pudendal nerve, record from track 4, station 1. *b.* stimulation, tibial nerve, record from track 4, station 4. *c.* stimulation, pudendal nerve, record from track 3, station 4. *d.* stimulation, tibial nerve, record from track 3, station 5. Time, 5 msec.

Considerable activity is excited in the tectum by these stimuli. Figure 13 illustrates comparable potentials evoked by the two pathways in the superior colliculus. The lower amplitude and longer latency of the activity following stimulation of the pudendal nerve illustrated by this pair of traces is a constant finding.

In the tegmentum, between the superior colliculus and the lemnisci, potentials of low amplitude and of long latency (12-22 milliseconds) were encountered. These were interpreted as potentials of the various nuclei of the reticular formation.

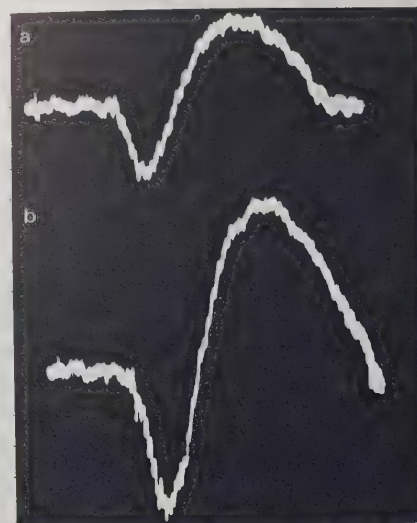


Figure 14. Recordings from superior colliculus: *a.* pudendal nerve, track 1, station 1. *b.* tibial nerve, track 1, station 1.

More rostrally in the brainstem, activity was encountered in the posteroventral nucleus of the thalamus. Representative recording (Fig. 15) shows the small but definite activity evoked by the pudendal nerve stimulation. There is in these potentials little to indicate cellular activity. The envelope of the deflection is positive in the first 10-15 milliseconds of the activity and little negativity is seen in the spikes, in contrast to the cellular poten-

tials recorded from track 5. It is likely that the discharges recorded here represent impulses in the lemniscal fibers at or before their terminations.

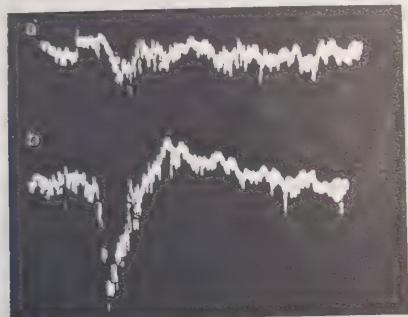


Figure 15. Recordings in posteroventral nucleus of thalamus: *a.* pudendal nerve, track 6, station 4. *b.* tibial nerve, track 6, station 5.

Single units of the lemniscal fibers were recorded on several occasions. Figure 16 shows a series of such traces where two discharging units were observed in a sequence of sweeps in which they were responding to increasingly strong stimuli delivered to the penis. In all of the records, the two units began firing in near synchrony. This latency of the initial spikes varied, from threshold to strong stimulation, a full 3 milliseconds. As the stimulus increased, the frequency of discharge of each of the units increased from 400 per second to approximately 650 per second. There was no clear indication of stepwise variation in the intervals and it seems clear that the repetitive firing on these long fibers is an expression of the reaction to some long-lasting excitatory state rather than the re-delivery of detonator-like signals through repetitive channels.

A record from the more dorsal part of the hypothalamus is shown in Fig. 17. This responded only to tibial nerve stimulation and was remarkable in that the active site was signalled, upon entrance of the microelectrode, by a spontaneous discharge, apparently of one unit at a frequency of less than 100 per second. This died out in a few seconds and the area was found to respond to tibial nerve stimulation with a latency of

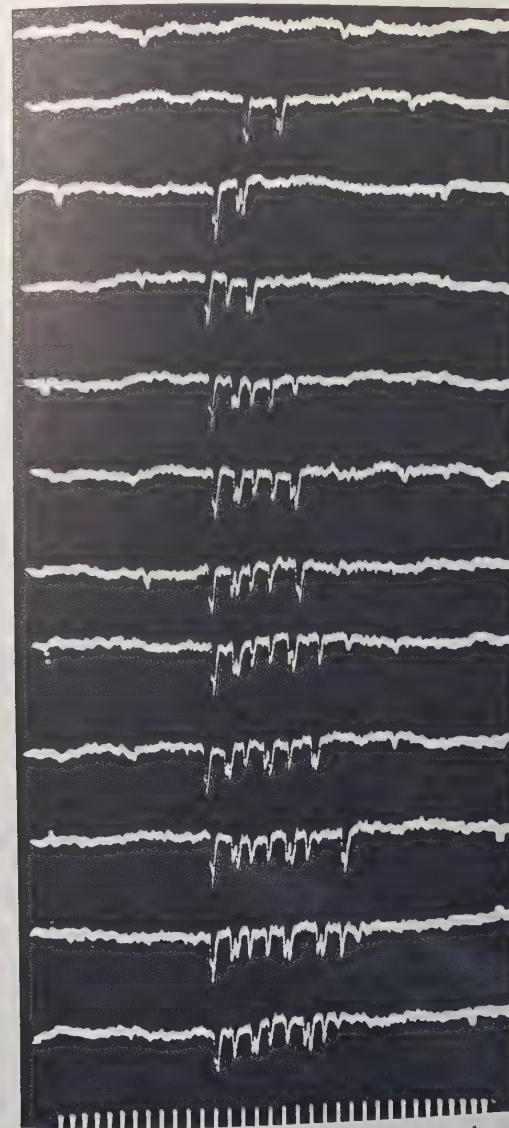


Figure 16. Sequence of records from posteroventral nucleus of thalamus evoked by stimulation of penis. From top to bottom, the stimulation increases. Time, 1 msec.

more than 20 milliseconds. No sites in the hypothalamus were found which responded to stimulation of the genitalia or of the pudendal nerve.

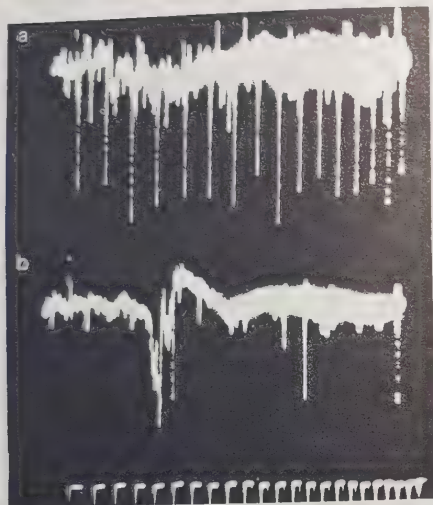


Figure 17. Recordings from medial hypothalamus: *a.* spontaneous activity recorded upon entrance of needle electrode. *b.* potential evoked by stimulation of tibial nerve after spontaneous activity had subsided. Track 5, station 8. Time, 5 msec.

Further rostrally, a site in the thalamus was examined which responded to both pudendal and tibial nerve stimulation (Fig. 18, *a* and *b*). The latency of the pudendal nerve response was 12 milliseconds to the first sign of activity. Four milliseconds later, a discharge of several units appeared which was characterized by high negative spikes. This was indubitably a cellular response. The response to tibial nerve stimulation consisted of a large positive deflection with very complex spiking. Immediately below this region, however, the response to tibial stimulation became simpler and showed a series of late single unit negative spikes with a latent period of 20 milliseconds as opposed to 8.8 milliseconds for the beginning of the overall deflection. The initial discharge frequency of this unit was about 700 per second.

No marking lesion was made at these sites so exact localization was impossible, but the medial location of the track and the secondary nature of the cellular response fits well with the interpretation that the site was in the medial thalamus and excited by thalamothalamic connections.

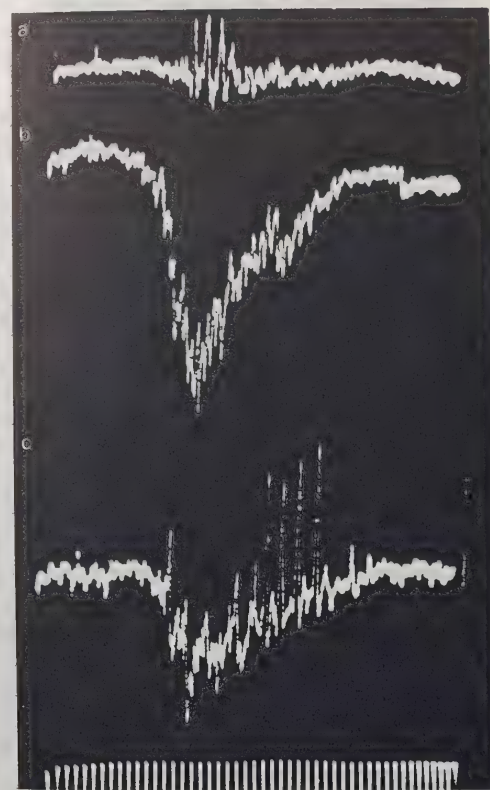


Figure 18. Recording in medial region of thalamus: *a.* pudendal nerve, track 5, station 2. *b.* tibial nerve, track 5, station 2. *c.* tibial nerve, track 5, station 3. Time, 1 msec.

The traces of Fig. 19 illustrate the evoked potential at the pericruciate cortex. They show the continuation of a feature

which characterizes the pudendal nerve (and genitalia) records, namely, the lower amplitude and the increased latency as compared with the activity following tibial nerve stimulation.

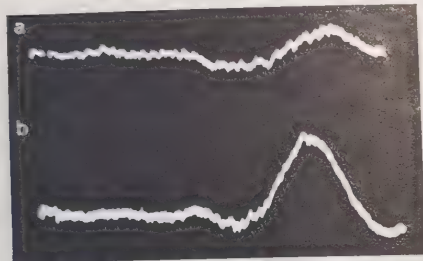


Figure 19. Recordings from pericruciate cortex: *a.* pudendal nerve. *b.* tibial nerve.

The Long Pathways. These experiments demonstrate that the activity evoked by stimulation of the pudendal nerve field in the ascending sensory tracts and in the related nuclei are distinguished by their increased latencies, lower amplitudes, slower rising time, and more restricted distribution than that evoked by stimulation of the tibial nerve. There is little doubt but that these properties are, for the most part, correlated with the special sensory mode of the genital field and with the 10-14 μ nerve fibers which characterize these afferents. Both the pudendal and the tibial nerves contain general sensory components with the peak of fibers in the 4-6 μ diameter range. It is the nature of these experiments, however, that they reveal most clearly the activities related to the faster fibers present in the nerves. In the case of the pudendal nerve, these are the 10-14 μ group related to the encapsulated end-organs in the phallus. The tibial nerve, on the other hand, contains a more rapid component of afferent fibers in the 14-18 μ range, presumably muscle and deep pressure afferents.

Perhaps the most unexpected finding in these studies was that the conduction velocities in the dorsal column of the spinal cord, as well as of the ipsilateral and contralateral columns, are very much slower than is the case in the tibial nerve activity. The fibers of the dorsal column are, of course, central fibers of

the primary sensory neurons and it is interesting to find that their conduction velocity is matched to that of their peripheral fibers. The implications of these findings in the secondary ascending tracts, however, are that signals are carried on fibers somewhat matched in diameter to those of the peripheral conductors.

BEHAVIORAL CONSIDERATIONS

Before discussing the genesis of sexual sensations in the clitoris, it would be well to discuss the importance of the phallus generally in the formation and maintenance of the body image. Self-awareness takes place in an individual largely through the generation of a body image. On introspection, this proves to be a rather complex amalgamation of awareness of the shapes, functions and importances of parts of the individual's body or person. The distortions by which a person's body image, as sensed objectively, differs from a photographic image are spectacular and meaningful. They are, of course, conditioned by the specific life-history of the person and his social milieu. Of more interest to us at this point are the distortions due to sensory innervation. In general the parts of the body which figure most importantly in our sensory consciousness are more vivid parts of the image. The mouth and the finger tips are, of course, accentuated as are the front surfaces of the body over the rear, the distal parts of the limbs over the proximal, and the exposed parts over the concealed. A good understanding of this is to be had from the map of the body which is detected on the sensory cerebral cortex and which is amusingly drawn as a homunculus by Penfield and Rasmussen (14). In this the tongue, lips, finger tips, especially of the thumb and index fingers, are greatly exaggerated with respect to their actual size. Though the representation of the genitalia has been shown by these and other authors to be on the paracentral lobule, the illustrations and texts are in general non-committal as to their relative place in the sensory homunculus. Not so with the behavioral scientists (and psychiatrists) who point out the very early awareness of the infant of his genitalia and of the concern which represents the social value

and impact of these organs in the adult individual. There is, however, a very special aspect to the sensory awareness of the genitalia which must be understood in order to resolve the ambiguities both of the neurologists' and behaviorists' treatment of the place of the genitalia in the body image. In contrast with the finger tips and mouth which have a sensory meaning and sensitivity rather uniform in time, *the genitalia, especially the penis and the clitoris, have two alternative states of sensory function, differing qualitatively and quantitatively. These states are associated with arousal and with non-arousal.* The non-arousal sex organ has a general cutaneous sensibility that differs little from that of the surrounding skin areas, except perhaps a distinctly richer bed of end-organs. Upon tumescence the sensory inflow from these organs is greatly changed both in meaning and in sensibility. This alteration is very marked and may easily be studied introspectively. It is clear that upon engorgement a sudden shift in the sensations from general skin sensibility to a characteristic sexually meaningful feeling is made, with the quality of the sensations acquiring a voluptuous nature by which they are presented to the consciousness in a quite different context. We have discussed above the peculiarity of the end-organs which one finds in the clitoris, penis, and associated sexual skin. The nature of the sensation which carries a sexual "sign" is hard to define. It is an intriguing possibility that the genital corpuscles with fine distal fibers to the skin surface react to the tissue pressure of tumescence as amplifiers of this sensory pattern, as discussed in an earlier paper (8).

Recent works of Morgane (15) and Hoebel (16) have suggested that the several appetitive functions affected by lesions along the course of the medial forebrain bundle (feeding, drinking, sexual behavior) are related to one another by being modulations of a behavioral activation circuit. According to these findings, stimulations of this system in the lateral hypothalamus may be expected to lead to activity on the part of the animal but the nature of the activity may be determined partly, at least, by the influences of the external environment or other sources. Thus, under experimental conditions a rat might, by stimulation at a single locus, be motivated to eating if food were

presented or to mating behavior if a receptive female were proffered instead. The interpretation is given that motivated behavior has both the elements of general activation (the medial forebrain bundle is shown to extend to the tegmental activating system) and specific modalities. It is also seen that under such circumstances, the stage of the complex sequence of sexual or courtship behavior which is initiated by the stimulation is one that is appropriate to the specific situation. These experiments and analyses clarify and illuminate the matter of motivated behavior and in doing away with the "feeding center" or "sexual center" view make a more plastic and sophisticated model of behavioral structure possible.

Importance of Positive Feedback. In respect to the function of the clitoris, or of the phallus generally, the above mentioned progress in behavior experimentation calls to attention a function which has been generally overlooked. This is related to the importance of positive feedback in crystallizing the inception of a behavior sequence. Under ordinary conditions, as contrasted to the greatly simplified surroundings in which motivational experimentation is carried on, the choice of behavior to accompany a particular arousal or activation event is not strictly alternative but instead two or more behavioral sequences might be, to some extent, appropriate. In some complexes of response, eating, mating activity, and flight, for example, the initiation of the behavior evokes a positive feedback mechanism which reinforces the behavior selected. Introspectively, the sudden sharpening of appetite upon commencing a meal is noted by all of us. This is in part due to the increased gastric motility by which the stomach itself makes more imperative the activity leading to its filling. With flight also, it is generally recognized that fear or the sharp increase in fear is consequent upon the initiation of running away. Similarly, the inception of mating behavior has such obvious reinforcements.

The first sign of sexual arousal is tumescence of the phallus. While in males this is principally an increase in size and then of hardness so that an awareness of the subject if not of the other individuals becomes an important datum, in women the sensations attendant upon tumescence of the clitoris are less inter-

pretable as a change in size and turgidity but are at once voluptuous in a way that seems not to be characteristic of the penis. To be sure, the fully erect penis is a source of considerable and important sensation of the most specifically sexual nature and by this fact the erection tends to perpetuate itself in the absence of other stimulation. But the clitoris seems through its own generation of sensation to be more supportive. In each instance, however, it may be seen that the nature of the situation is one of positive feedback—the action stimulates to more action and the usual outcome is a rapid progression to a maximum arousal. It should be noted in passing that whereas negative feedback is more or less ubiquitous in biological systems and underlies nearly all finely regulated activity, positive feedback with its “avalanche” effects is to be sought and found in those action sequences which cannot in the short run be considered as serving homeostatic purposes (though in the long run they might promote survival of the individual or of the race.)*

*The sequence of sensations consequent upon arousal and tumescence of the clitoris is probably of great importance in the very young child in the development of the genital aspect of body image. This has important corollaries both in normal and abnormal behavior. The spontaneous arousals which we can see so clearly in male infants and again at the approach of puberty are probably paralleled in girls. Through them the individual fills out the special area of body image corresponding to the genitalia during socio-sexual stimulation. In the course of events, manual manipulation becomes centered on the phallus and hand-to-clitoris pattern is established. Very little is known about this: nearly all observations have been made on boys where the fact of arousal is manifested by erection. The reason for attempting analysis of this growing-up pattern here is to offer my hypothesis that it is in this sequence that we should look for the pathological effects of puritanical inhibition which seems to be the basis of a certain amount of sexual inadequacy (lack of orgasm) in women. The fact that the arousal sequence, important in learning or establishing dynamic body image, is one which occupies a certain amount of time and consists of one level of excitement leading to another seems to me to offer an insight into the remarkable amount of inhibition which may be superimposed on subsequent behavior by overstrict attitudes in the child's bringing up. As I see the operation of this, the child is inculcated early with a powerful negative response to the initial tingling sensation and learns to inhibit or completely abort the arousal sequence at a time when it has not acquired its overwhelming level of excitement. In a strict and overprotective environment, this inhibition not only becomes more effective through repetition but due to the suppression of any verbal communication relative to it, it sinks into the unconscious mind. It is easily seen how such a mechanism could produce in a young mature woman a complete inability to undergo normal arousal and even a lack of appreciation that such an organ as the clitoris exists.

Specific information on which to evaluate the above hypothesis is not available to me. However, I do offer the following account from an adult informant which gives some insight into the operation of moral inhibition in the arousal sequence. This woman was raised in a home of intense religious fervor and estrangement without separation of the parents. Upon marriage she was anorgastic and it took several years of intense coaching on the part of her experienced and sophisticated husband to establish a pattern leading to orgasm. Later, she separated from her husband, became intensely religious and inhibited all forms of sexual activity. She relates that she recalls during this time waking from sleep in an arousal sequence leading towards orgasm. Her guilt was so great that she would immediately become angry—even to the point of slapping her own face—and the climax would be successfully aborted. Later, this woman acquired insight into her own behavior, became sexually active and contracted a successful second marriage.

Positive Feedback Mechanisms in Sexual Arousal. As pointed out above, there is a positive feedback phenomenon by which sexual arousal, when commenced, tends to be “locked in” as the dominant ongoing behavior much as other appetite satisfying sequences are reinforced through feedback from their own target organs. Thus the consideration of the clitoris as solely, or even primarily, an organ which responds to mechanical stimuli associated with the sex act misses the point. The lack of attention of this aspect of clitoral function is in part ascribable to a curious view among many investigators that “subjective” sensations are not “physiological.” Thus we find in such leading contemporary works as that of Masters and Johnson (1) no discussion of the type of sensation perceived by women during tumescence and sexual activity, but only the “objective” features of the sexual act are detailed. This, to me, seems like a dust bowl view of physiology. Perhaps a sounder consideration would be that all phenomena involving neural mechanisms are neurophysiological, even though some may be available at the present time only by asking the people concerned what they feel.

Upon such questioning we are informed by several reliable respondents that a tingling sensation is the first sign of sexual arousal and that it in itself is a highly effective erotic stimulus that does indeed tend to channel the attention on the sexual situation which engendered it unless dispelled by some other stimulus or situation. The tingling sensation is replaced by, or, perhaps more accurately stated, grows into a buzzing sensation as the sexual involvement becomes greater. This sensation in

turn strengthens into what is described as a throbbing feeling of the organ. Informants, of course, differ in their verbal patterns as well as, seemingly, in the intensity of their experiences. The further stage of this throbbing is, as related by one informant, a further progression to an actually painful throbbing. Another described the final involvement of the musculature of the genitalia: "Suddenly, I could feel each individual muscle of the perineum as it began to contract spasmodically," this last describing an experience of unexpected confrontation at a social gathering with a man who had, though of slight acquaintance, taken on an intense sexual meaning for her.

In this description of the voluptuous feelings by which the tumescent clitoris supports sexual attention and involvement, the consideration is of the situation in which petting or intercourse is not involved. This then is a measure of the meaning and intensity of the sensations generated by the process of tumescence itself. It should be pointed out here that little is known of the sequence, or of the details of the actual swelling of the clitoris and that unfortunately none is furnished *de novo* in this report. Masters and Johnson have commented on the variation from woman to woman of the erectile events and of the difficulties in their observation. Anyone who has tried to make adequate measurements of this organ in its states of action will realize the formidable task it presents. We may suppose, however, that the pressure of the erecting organ is a stimulus to the encapsulated nerve end-organs of the clitoris and that the pressure of the neighboring tissues, which became engorged, and of the arterial pulse in the later stages contribute to the impressions of the informants which I have described above.

Mechanical stimulation of the clitoris is a most important aspect of the consummatory sexual act. The infrequency of those individuals who are able to deliberately progress through the stages of arousal to the orgasm is remarkable and no critical observations or experiments have been published on them. However, it would seem that many women are able to pursue this course during sleep or at the moment of waking up, for orgasm in this setting is well known and commonly reported. Again, we find little in the literature to help us understand the behavioral

structure of these sequences. On the basis of preliminary observations, I am convinced that erection of the clitoris during sleep, especially paradoxical or REM sleep, occurs in a fashion paralleling that described for the penis (Fisher *et al.*, 17). There is, obviously much more reliable information on the response of the clitoris to mechanical stimulation as it occurs during intercourse or during masturbation.

The Female Sexual Response. The difficulties involved in the analysis of the role of mechanical stimulation of the clitoris during intercourse are obvious. With two persons rather than one involved and the lack of easy access for observation of the clitoris, a problem is presented which will have to be overcome by a sophisticated recording approach using well-trained subjects. The situation is not hopeless; Masters and Johnson have made some very promising advances with their technique of artificial coitus. In what is probably a more productive technique at the present time, the inter-relation of clitoral function and consummatory sexual behavior may be approached experimentally in analysis of masturbation to orgasm, especially with an electrically driven vibrator.

Vibrating at the rate of 60 per second, a strong stimulus can be delivered to the clitoris without actually touching the sensitive glans. The nature of the stimulus is such that the excitation produced is principally through the encapsulated end-organs rather than through the general cutaneous afferents. There is considerable variation from subject to subject as to the preferred method of application of the stimulus. In the series of experiments analyzed here, some of which are presented in recorded form, the subject preferred a slow stroking of the mons and shaft of the clitoris with the vibrator. These strokes lasted about 10 seconds each and were separated by an interval of approximately the same time. The readout of this type of experiment can be made, as were those presented here, by placing a sensitive transducer within the introitus or higher in the vagina and recording the pressure as a signal on a physiological recorder. Information was augmented by direct observation and by digital palpation during this series of experiments.

In the discussions above it has been pointed out that the

sexual response does not correspond to what we ordinarily think of as a reflex; that is, a simple response which occurs with predictable frequency following a stipulated stimulus. The response is as we shall see anything but simple and in fact involves the entire motor behavior of the subject. With these reservations in mind we will, however, examine the parts of the sexual response which involve the muscles associated with the genitalia. There are four groups of musculature which are involved primarily in this reaction. First, there is the superficial musculature which, in the human female, consists of a considerable number of muscle fibers lying superficially and laterally to the mouth of the vagina, and to some extent, encircling that orifice. The fibers insert anteriorly upon the shaft and crura of the clitoris. In the same superficial layer is also the transverse perineal muscle which arises on the ramus of the ischium and inserts in the connective tissue immediately behind the vagina, the perineal body. The third member of this superficial musculature is the ischiocavernosus muscle. This arises on the ramus of the ischium on each side and inserts into the shaft of the clitoris in such a way as to pull the clitoris downward when contracted, and at the same time, constrict the crura of the clitoris.

A second set of musculature involved in the sexual response consists of the muscles of the urogenital diaphragm. This is a complex and rather strong aggregation of muscle fibers forming a shelf-like diaphragm across the anterior or urogenital part of the pelvic aperture. The muscle when contracted may be felt from the lowermost part of the vagina as a shelf or shelf-like projection.

The third set of musculature exceeds those already mentioned in mass and strength and consists of the medial portion of the levator ani muscles frequently differentiated by the term pubococcygeus. This muscle is detected by palpation as a wide strap-like muscle running on either side of the vagina and uniting behind the vagina as a sling.

The fourth and final set of the muscles considered here is the intrinsic musculature of the lowermost end of the vagina. This smooth muscle has rather different properties than the skeletal or striated muscles described above. These four categories of

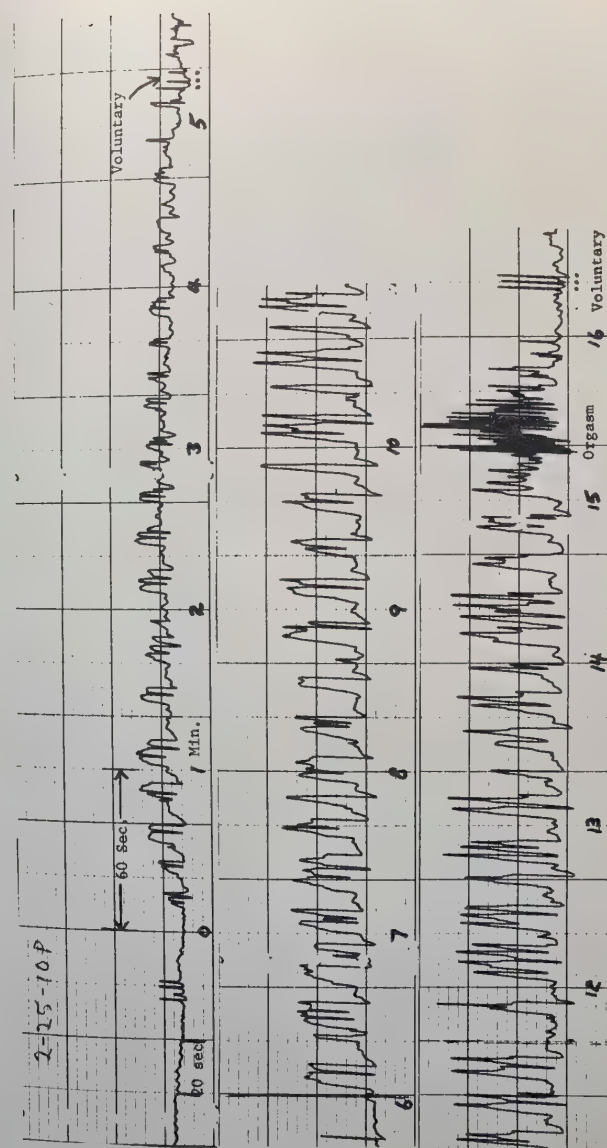


Figure 20. A record of the complete female sexual response made by a sensitive pressure transducer in the lower third of the vagina. For details, see text.

musculature are separately mentioned here because in the response building up to the climax and in the orgasm itself, each plays a particular role.

Figure 20 presents a recording from the pressure transducer in the introitus of the vagina during the twenty minutes or so occupied by the build up and release of the sexual response. The recording obtained from this area consists of a series of slow (3 or 4 per minute) waves with more rapid wave responses written upon them. In addition, there is a constantly rising baseline of these pressure responses, and finally, a sequence of about one per second contractions which terminates the response. Following that there are two sets of three waves in which the subject was asked "to make as strong a voluntary contraction as possible." Each of the responses to this is underscored with a dot. It will be seen in this record that seven or eight minutes following the start of the stimulation the responses suddenly became much more intense. It is at this time that the subjective sensations from the clitoris began to take on a throbbing characteristic.

From a series of 10 such recordings and from twice that number of careful digital palpations during similar sequences the following conclusions have been drawn. Slow 3 or 4 per minute waves represent powerful contractions of the urogenital diaphragm especially of those elements of it forming a sphincter around the lower third of the vagina. Faster 15 to 20 per minute waves superimposed on these slow contractions represent the contractions of the levator ani. In Fig. 21 recordings during similar sequences are presented with the pressure transducer in varying positions in the vagina. In the lowermost record (Fig. 21, e), the transducer was 4 inches within the mouth of the vagina, in other words, high in the posterior fornix. At this position, the waves representing the levator ani are demonstrated but the slow waves which I conclude are records of the contraction of the sphincter elements of the urogenital diaphragm are no longer clear, though recordings from the lower third of the vagina (Fig. 21, b and c) show them very well. The baseline of the record in Fig. 29 shows a gradual rise which is characteristic of all the records taken. This increase in baseline pressure is due

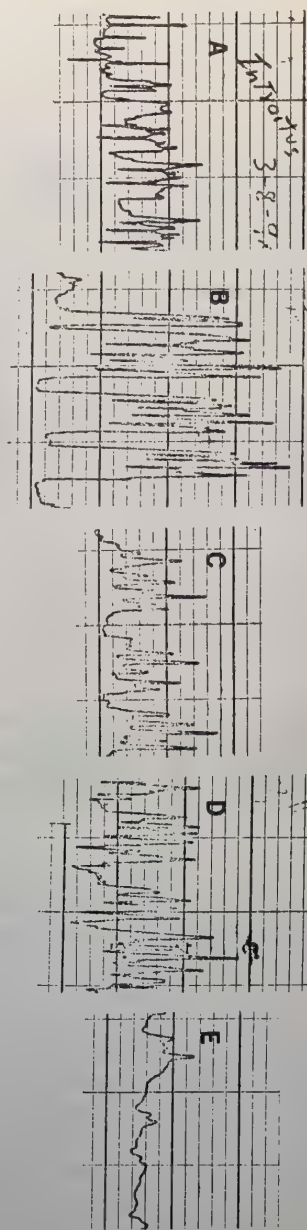


Figure 21. A series of records, taken during the build-up to one sexual response, with the pressure transducer placed at differing positions in the vagina: a. at the introitus. b. one inch within the vaginal orifice. c. two inches. d. three inches. e. four inches.

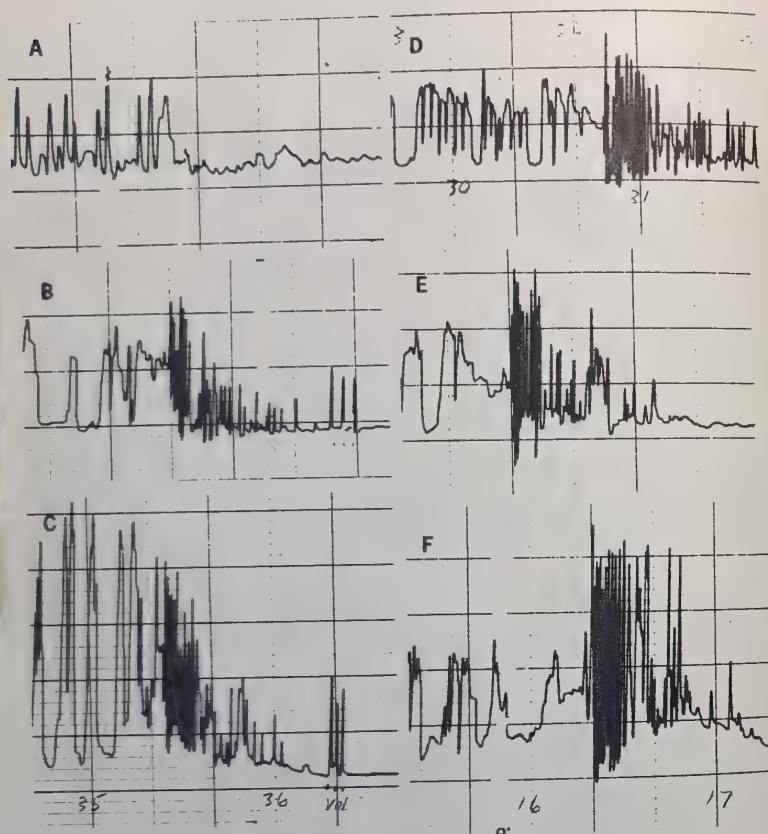


Figure 22. Six orgasmic responses: *a.* record taken with transducer high in the posterior fornix, showing the absence of the sharp contractions. *b.-f.* five records recorded from the lower third of the vagina to show the similarities of the responses.

to an increased contraction or tonus of the smooth musculature of the lower vagina and, to an undetermined extent, represents also the increased hyperemia of the walls of that organ and of the tumescence of the vestibular bulbs. Interestingly enough, the superficial musculature takes no part in this response up to the commencement of the orgasm. With the orgasmic response comes

a series of rapid (ca. one per second) contractions which represent activity in the superficial musculature only. These are the ischiocavernosus and bulbocavernosus as well as the transverse perineal muscles. The contractions are of considerable strength and may be seen as a rapid elevation and depression of the clitoris as well as a bowing of the labia minor. Comparing the responses shown in Fig. 22, *a* and *b.-f.*, one sees that in the former where the pressure transducer was very high in the vagina, no record of these fast contractions is seen although the orgasm represented in this was vigorous and typical in all respects.

A feature of the orgasms which deserves some attention is the very sudden rise of pressure in the lower vagina which is sustained for a period of 12 to 15 seconds before the contractions of the superficial musculature begin. This same feature has been noted by Masters and Johnson who have pointed out that the subjective sensation of orgasm commences at this point well ahead of the muscular contractions. My observations fit their statements completely. Figure 23 shows in considerable expansion a more detailed curve from the pressure transducer in another response.

The recordings here were obtained from one subject. It is a remarkable feature that they are so similar. Whether this implies that they may serve as "fingerprints" remains a moot point. At any rate, as Fig. 21, *b.-f.*, show there is an unexpected uniformity in these responses.

An attempt of justification should be made with respect to the fact that all detailed observations of the sexual response in this account were made upon one subject. The thousands interviewed by Kinsey and the hundreds of subjects studied by Masters and Johnson have set the stage for a numerical qualification which the present description does not measure up to. Perhaps it should be borne in mind that as one progresses from the psychological to the purely physiological, there is a considerable constriction of the variation in activities and responses. By and large, the purely physiological responses vary within narrow limits, and these would probably be expressed as variations in the duration of the various phases, number of contractions, strength

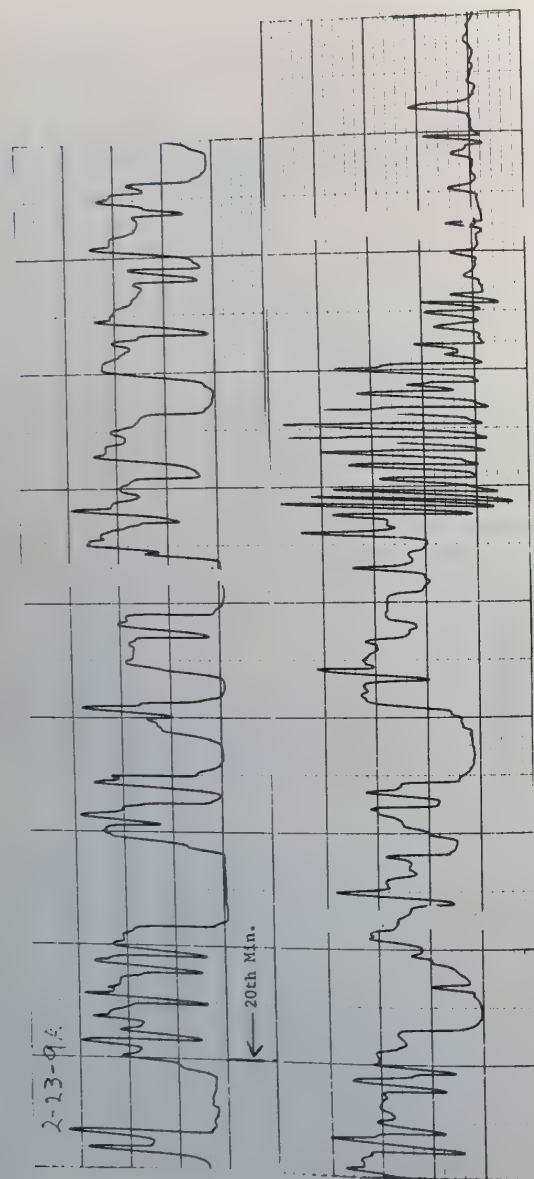


Figure 23. The final three minutes of a female sexual response, recorded on an expanded time scale to show details but otherwise as Figure 16.

of contractions, optimal parameters of location and frequency of stimulation, and the degree to which psychic stimuli and hormonal balance might inhibit or enhance the response.

SUMMARY

The clitoris, endowed with an amazingly rich sensory innervation, is supplied with nerves characterized by high population of fibers of middle diameter, the nerve supply to the encapsulated "genital" corpuscles. A unique central segmental reflex pattern corresponds to this innervation. A hitherto unexpected matching of the intermediate fiber conduction velocities by the secondary ascending fibers making up the spinal and brainstem pathways for this sensory system is reflected in the type of bioelectric potentials recorded with microelectrodes in various levels of the brain.

An analysis of the female sexual orgasm insofar as it is observable at the perineal field shows differential roles played by four muscle groups, the levator ani, the pelvic diaphragm, the more superficial ischiocavernosus and other perineal muscles and the intrinsic smooth musculature of the vagina. The changeable "sign" of the genital innervation and the place of positive feedback in the arousal process is examined and on the basis of observations of the sequential steps in clitoral function in arousal, a hypothesis is presented concerning the effectiveness of inhibition upon the normal maturation of sexual responsiveness.

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Chapter V

MODERN CONCEPTIONS OF CORPORA CAVERNOSA FUNCTION IN THE VAGINA AND CLITORIS *

V. Danesino and E. Martella

Contributions to the knowledge and structure of the blood supply of the corpora cavernosa of man are numerous, but in the anatomy of woman, investigations of the corpora cavernosa of the vagina and clitoris are scanty. The literature is fragmentary and descriptions and interpretations are contradictory. All are agreed that the structure is highly vascular, with blood spaces (lacunae), surrounded by solid walls (trabeculae).

Sappey (1882) maintains that the structure of the clitoris is identical to that of the corpora cavernosa in man, and he mentions nerve branchings which irradiate between the trabeculae. Sappey distinguishes between two types of trabeculae: the fibrous and the muscular. These intertwine so that we can delineate lacunar spaces, which are capillaries of enormous caliber, extreme brevity and multiple anastomosis.

Rouget (1884) states that the trabeculae are composed of muscular fibers, while Legros (1866), although he admits the presence of the muscular component, describes also the presence of connective fibers and of elastic fibers, and adds that some of the trabeculae are formed only by elastic fibers.

Retterer (1890) considers the lacunae formed by a frame of connective and elastic tissue, with muscular-fibrous cells, which are under the endothelium. On the other hand, Klein and Kolliker maintain that these fibrous cells are part of the trabeculae and are scattered among bundles of connective and elastic tissue.

Anile (1919) doesn't mention the corpora cavernosa but states that the vestibular bulbs are erectile tissues, made of large lacunae, limited by very fine strands (trabeculae).

Bartelli (1925) describes the bulbs of the vagina as being cav-

*Reprinted with permission from *Archivio di Ostetricia e Ginecologia* (Napoli), 60:150-167, 1955. Translation by Benedetto Macaluso, M.D.

erous tissue, which is also formed by flexible veins, which anastomize among themselves and which are separated by connective strands with scanty, smooth muscular fibers. With reference to the clitoris, the albuginea sends some connective bundles into the trabeculae and forms a median septum, with numerous slits, crossed by vessels which establish a functional continuity between the corpora cavernosa of both sides.

Angelico (1939) in a meticulous investigation of the structure of the corpora cavernosa of man and woman, in various ages of life, maintains that in the adult, the trabeculae have a double morphological structure. Some are formed by a connective stroma upon which rests the muscular tissue; others by intertwined connective-muscular bundles. He also studied the structural modifications in the various stages of life and pointed out that in old age, there is an increasing amount of connective tissue and elastic fibers and rarefaction and condensation of muscular tissue.

We have examined the structure of erectile organs in women of various ages of life, and we have paid much attention to the presence of blockage mechanisms and of arteriovenous anastomoses, which we found in the core of the corpora cavernosa and in the surrounding connective tissue. We have examined about ten human subjects from a fetus at term (nine months) to adults of about eighty-four years of age.

Tissue was examined microscopically with the usual technique, staining with hematoxylin-eosin, Mallory-Azan technique, Weigert and orcein for elastic fibers, and silver impregnation for the reticular tissue. It shows that in newborns, the erectile tissue has an embryonal morphology, with scanty cytoplasm, round nuclei and outstanding and very fine connective strands, which form envelopes around vessels, or fine bundles, among cells. The lacunae are oval or round. The elastic fibers condense around the lacunae and under the endothelium. The ratio between the surface of the vessels and the surface of trabeculae is inverse, when compared to that of the adult. And, in newborn, the area of the solid trabeculae is much greater than that of the lacunae, which contain blood.

With reference to the invaginations described by Ebner, Roth-

feed and Angelico as ball-valves, we do not consider these formations as blockage formations, but rather as crescents, which are limited by the wall and made up of mesenchyme, with scanty elastic fibers. Contrary to the muscular ball-valves of the cavernous urethra which, according to Conte and Pirro, are present also in the adult, these ball-valves of the clitoris and of the corpora cavernosa of the vulva are transitory and are not found after a few years of life.

After birth, differentiation of the erectile tissue evolves further, and by the end of the second year, the trabeculae are much more in number, are thinner, and surround round areas and small spaces, which are oval and oblongated in shape. At age two, the subendothelial fibrous cells show more elastic fibers, and the invaginations tend to be reduced in number and in thickness. According to Angelico, this is probably due to the slit-like configuration of the lacunae, which makes it almost impossible to visualize the crescents.

In the adult woman, the trabeculae have a characteristic plexus-like morphology. The trabeculae of the corpora cavernosa are generally large and thick, and the central morphological anatomy is not much different, as far as thickness is concerned, from the peripheral one. On the other hand, in the corpora cavernosa of the clitoris, the trabeculae of the central area are thinner and the blood-containing spaces are larger. Of special interest are the muscular-fibrous cells, which become part of the core of the trabeculae. Interesting also is the finding that under the endothelium we find small bundles of fibrous cells which are oriented in circles, and that in some places, circumscribe long areas of the walls, following the folds of the walls.

In the peripheral trabeculae, the morphology of the fibrous cells is varied. We see a few groups in which the fibrous cells are placed longitudinally, but we also observe other groups which are circular or oblique in shape. We do not agree with the opinion, expressed by other authors, that in the clitoris, trabeculae with connective stroma are prevalent. Instead, we see the peripheral area as being made up of large short bundles, with numerous smaller bundles, which are directed especially longitudinally, and which also enclose small and numerous lacunae. In the cen-

tral area, the main bundles are made up mostly of connective tissue, and the lacunae increase in number and magnitude. But also, in the central core, we may find subendothelial fiber cells, which are oriented in many different directions.

It is useful to compare clitoral and corporal anatomy with research of Motta, who described the fiber-muscular cells of the ovary and the dehiscence of the follicle. Motta describes, in the intrinsic apparatus of the ovary, a marginal layer with fibers which are directed longitudinally and frontally, and also a muscular net between the vessels, which surrounds the vessels of the mesovary and of the bulb. Contraction of the muscular net compresses the vessels and decreases their volume, particularly of the veins, which have weak walls and little musculature. The effect is to decrease blood flow out of the ovary; it is, in essence, an erection of the ovary.

There is much elastic tissue in the corpora cavernosa, concentrated in the peripheral trabeculae, where deep, isolated invaginations protrude into the lacunae. Elastic tissue constitutes the central axis or is spread out in a diffuse net, with very thin areas, which is seen under the endothelium.

The statement by Rouget, that the walls of the lacunae are mainly made up of muscular fibers, and the statement by Legros, that the elastic tissue is prevalent everywhere, do not seem to be correct. Our research shows the peripheral clitoris to be more muscular, while the central structures are mainly made up of connective tissue. The lacunae of the vestibular bulbs are, on the other hand, of muscular-connective tissue. In older people, the lacunae are wider and the trabeculae thinner. We see that the thickness of the frame is diminished which, of course, entails a much wider dilatation, and the spaces which will then contain blood are greatly increased in volume. As in other organs, after menopause, muscular tissue of the trabeculae is reduced. This atrophy may be quite extensive and is subject to individual variations. Connective tissue, rich in cells and scarce in fibrils, is slowly substituted for the muscular fibers. In some subjects, as has been observed by Angelico, the connective tissues take the shape of compact and irregular conglomerates. The reticular connective tissue is replaced by fibrillar connective tis-

sue; by using silver impregnations only, in a very few cases, we have been able to point out large, tortuous filaments around the groups of fibrous cells. However, we have never been able to discover the characteristics of the reticulum, which surrounds the muscular elements in the adult. The increase in elastic tissue is particularly constant near the albuginea.

In the axis of the trabeculae, it is common to find large fibers which become thinner and which sometimes form a fine reticulum under the endothelium.

We have not been able to find out the stain modification described by other authors in other organs. As far as we are concerned, our observations are the same as di Ciardi-Dupre on the elastic tissues of the tube, and are the same as di Danesino on the vagina. The specific staining reaction of the elastic fiber does not change with age.

Having examined the structure and modification of the erectile organs during various ages of life, we will now consider the blockage mechanisms which regulate input and output of blood. But first, we shall talk about the anatomy of the area. The blood supply of the bulb is the bulbar artery, a branch of the internal pudendal artery. The veins of the bulbs wind forward in the plexus venosus intermediate, which connects the two bulbs and these with the corpora cavernosa of the clitoris. These veins end in collecting veins, which empty into the internal pudendal vein. The bulbar veins communicate also with all the venous system of the genitalia by means of dorsal superficial branches, which end in the internal saphenous vein in the pudendal plexus (See Fig. 24).

With reference to the physiologic function of the trabeculae, Levi observes that the organs of copulation increase in volume and change shape because of the input of blood. Firmness increases because the expansion of the lacunae is opposed by considerable resistance, which endeavors to constrict them. Some of the resistance is from the fibrous envelope and by the muscular apparatus which surrounds the whole organ; sometimes the dilatation of the vessels does not involve the whole system, but only a portion.

With erection, we observe two main phenomena. The first is

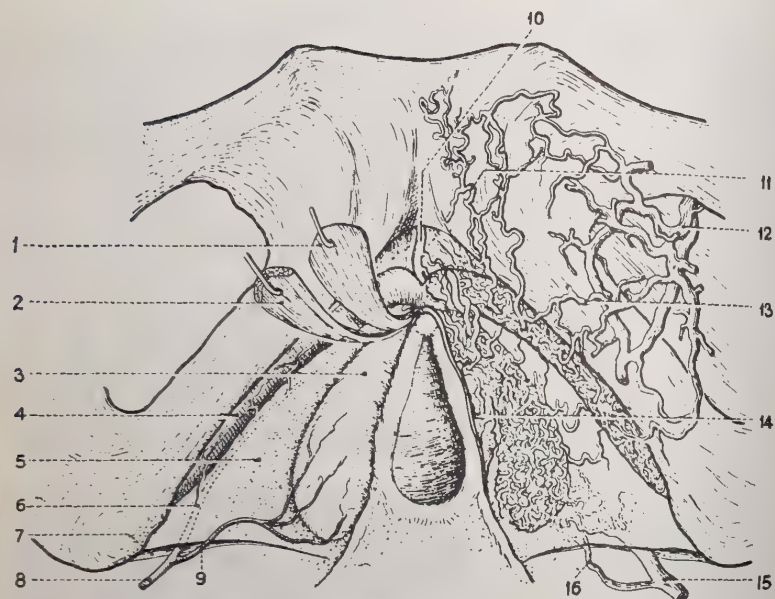


Figure 24. Bulbs of the vagina and the corpora cavernosa of the clitoris, seen from the front. On the patient's right is the artery; on the left are the veins. 1. Bulbocavernosus muscle. 2. Ischiocavernosus muscle. 3. Vaginal bulb in its albugineal sheath. 4. Peripheral portion, corpus cavernosum. 5. Middle perineal fascia. 6. Deep perineal artery. 7. Alcock's canal. 8. Internal pudendal artery. 9. Bulbar artery. 10. Dorsal vein of the clitoris. 11. Connections to the subcutaneous abdominal veins. 12. Obturator vein. 13. Connecting veins. 14. Veins of the labia minora. 15. Internal pudendal vein. 16. Bulbar vein.

the input of arterial blood. The second is the temporary blockage of the veins which drain the erectile network. This mechanism is regulated, according to our research, by a specific blockage mechanism, which can be found in the arteries and the veins. The arterial branches are provided with subintimal, longitudinal muscular fibers. These are on opposite sides of the wall, sometimes isolated, sometimes contiguous, and are termed *Polsterarterien* by Bucher (See Fig. 25).

When the circular musculature of the media and the longitudinal musculature of the ball-valves contract, the lumen of the

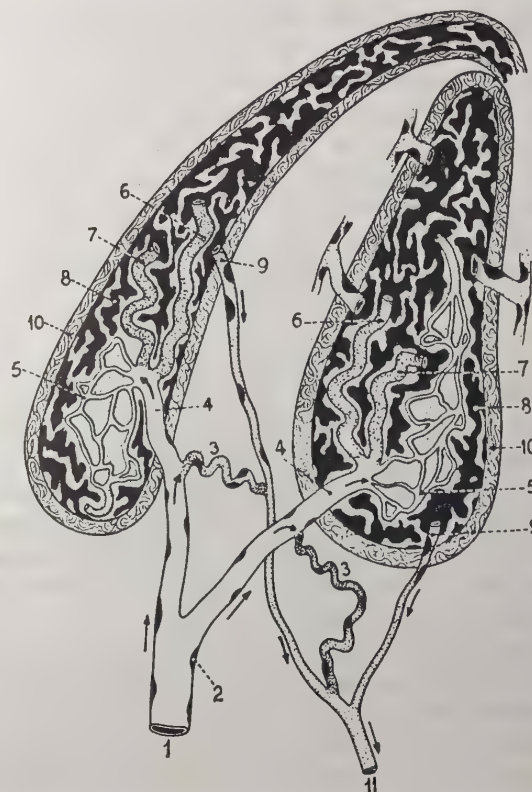


Figure 25. Diagram of circulation during engorgement (erection). In the artery (1) the little cushions (2) are relaxed and the anastomotic tract (3) is closed by turgor of the epithelioid cells. The blood entering the corpus cavernosum passes in small amounts through the nutrient arteries (5) and in larger amounts through the helicine arteries (6 and 7) and into the lacunae (8), filling them. The venous block (9) slows the flow out of the lacunae.

vessel is reduced, or completely obliterated, with consequent diminution or interruption of blood flow. But the arteries which penetrate into the corpora cavernosa give rise to two types of ramification: a) so-called helicine vessels, which after a tract which may be more or less tortuous, run directly into the venous lacunae, and b) the so-called feeding (nutrient) branches,

of fact, according to this author, in arteries devoid of myo-epithelial cells, contraction of every fiber is up to 62 percent. In the vessels with myo-epithelial cells, the contraction is reduced to 5 per cent. This theory seems doubtful because often areas with myo-epithelial structure are not provided with fibril cells, which have a circular shape or longitudinal shape and, also, these tracts of the wall are often found between adipose tissues and connective tissues. In this case, the contraction of the wall is normally sustained by muscular elements.

In summary, we are inclined to think, as Doctor Lambertini does, that the myo-epithelial cells have as their function helping the muscular cells. But, while the muscular cells respond directly to nervous stimuli, the myo-epithelial cells also respond to chemical stimuli. These (myo-epithelial) sponge cells, by absorbing water, will diminish the flow of arterial blood and by a reflex mechanism will deprive the tissues of blood.

We have observed sometimes in the smaller arteries, found between the bulbocavernosus and ischiocavernosus muscles, those specific apparatuses, which were called pedunculated ball-valves, described first by Bucciante in the vessels of the human prostate. These ball-valves are invaginations of the whole wall of the media or of the intima of the vessel walls, and are provided with a pedunculum, which herniates into the vessel lumen, and when observed in longitudinal sections, look like spikes which are free in the lumen. The core of these invaginations is fibrous cells.

These structures are present in the uterus, ovary and vagina, and are considered a valve mechanism to occlude the arteries. However, we must also mention the viewpoint of De Giorgi, who suggests that this particular structure may be only a mirage, derived from the overlapping of several layers, depending on the plane in which the section is being cut, since these arteries run a helicoidal (spiral) course. Undoubtedly, this kind of mistake can be made if the microscopic technique is not exact, but a meticulous examination of the slides, prepared by our techniques, allows us to follow the morphology from the beginning of the introflexion to the very end of the pedunculum. We have, therefore, been able to show that in the female pudendal arteries, the

invaginations are constituted of intima and media. We have observed in two cases that the spikes contain the adventitial connective tissue, we could clearly see the vasa vasorum.

We are particularly concerned with the small caliber arteries, which have an undulating course. On the basis of our studies, we believe that the arterial vessels, where these pedunculated ball-valves are observed, correspond to the bending of the vasa vasorum, as Denesino has demonstrated in the human vagina.

On the basis of our research, we can give a functional interpretation to these complex circulatory mechanisms. During coitus and presumably in other physiological conditions (e.g., dehiscence of the follicle during the menstrual period), blood through helicine arteries enters the lacunae of the bulbs in increased quantity. Specific receptors produce, in the neurovegetative centers of the lumbosacral tract, an active state which, because of the summation of afferent stimuli, creates reflexively vasodilatation of the vulvar area.

This mechanism apparently may also be elicited without any local stimulus, by way of cortical impulses which, by themselves, cannot induce activity of the neurovegetative centers of the lumbosacral cord, but can lower the excitability threshold. Upon reflex action, the blockage mechanism of the arteries is inhibited, and (sometimes) the venous ball-valves contract, blocking the venous lumen and causing the structures to engorge.

We have also considered the architecture of the fibrous cells, which are oriented longitudinally in the peripheral areas and have a variable arrangement in the central ones. The musculature actively participates in the functional mechanism, because the trabeculae increase in thickness in the flaccid state and diminish in thickness during the erectile state. With reference to the albuginea, we cannot consider it as a simple envelope, since it has a physiologic value in prohibiting excessive distention of the organ. Therefore, we consider the albuginea to act indirectly through a reflex mechanism upon the blockage mechanisms.

Finally, we must point out that the corpora cavernosa had previously been interpreted as capillaries or dilated veins, but following Braus, we think of this vascular net as a very complicated arteriovenous anastomotic system. The intermediate seg-

ment, interposed between the arterial system and the venous lacunae is the helicine arteries, which have myo-epithelial structure.

In summary, from our research, it appears that the circulation in the vulvar region is regulated in a reflex way by the neurovegetative system. It presents some structural characteristics, different from all the other organs, which can explain, on a morphological basis, the complex circulatory mechanism set into action by various physiologic conditions.

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Chapter VI

CYTOCHEMISTRY OF CLITORAL SENSORY NERVE ENDINGS

Luigi Giacometti and Haruo Machida

With the specialized staining techniques now available, it is possible to delineate the chemical components of individual nerve cells and subdivisions of the cells. It can also be shown that different species have different cellular chemistries. The cutaneous nerve endings of cats, cows and goats have alkaline phosphatase activity (1,2). Among the subhuman primates, only gibbons show a positive reaction in their specialized sensory nerve endings (3,4); the galago has alkaline phosphatase in the hair follicle end-organs (5). Here we report observations on the presence of alkaline phosphatase and cholinesterase activity in the sensory end-organs in the human clitoris.

In our study, we used the clitoris from seven subjects, obtained five to six hours after death. Frozen sections, fifty to seventy-five micra in thickness, were fixed for four hours in chilled ten percent neutral formalin. Alkaline phosphatase was demonstrated with the cobalt sulfide and the azo-dye techniques of Gomori (6). For each tissue, specimens were also stained with the method of Koelle and Friedenwald for cholinesterase (7) and with the silver impregnation technique of Winkelmann for the demonstration of neural elements. Our findings were as follows.

In the clitoris, the most frequently occurring nerve terminals are the genital corpuscles, unencapsulated masses of naked axoplasmic neurofibrils which are rolled and twisted upon themselves. Since the structure of these elements is similar to that of those found in other mucocutaneous surfaces, Winkelmann named them all muco-cutaneous end-organs (9).

Genital corpuscles are found predominantly in the sub-papillary layer of the dermis, more numerous in the lower half than at the apex of the clitoris, and larger near the margin of the labia minora than elsewhere. Each nerve ending consists of several irregularly wound, nonmyelinated nerve fibers imbedded in a

non-nervous fine granular substance (Fig. 27). We have found no end-organs within the stratified squamous epithelium of the clitoris.

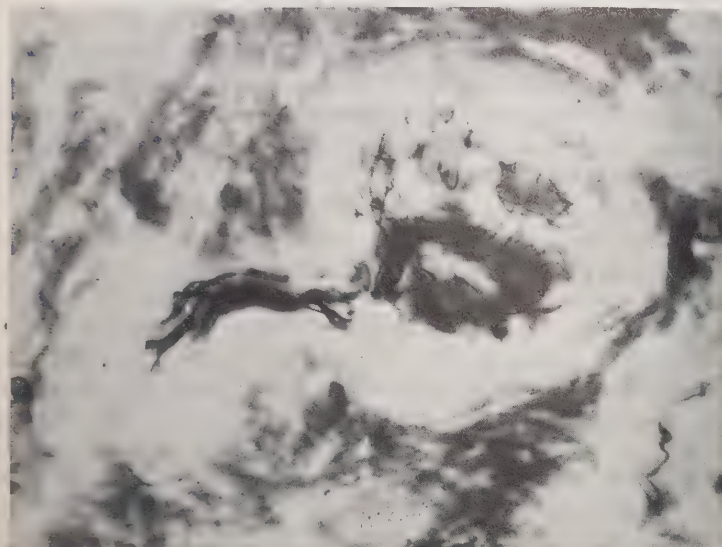


Figure 27. Horizontal section from human clitoris, showing the characteristic body of a mucocutaneous end organ. Winkelmann's silver method. (X300).

These structures are intensely reactive for butyrylcholinesterase as are all other end-organs (Fig. 28). Genital corpuscles, however, also show a generalized reaction for alkaline phosphatase when tissue slices are treated with either the cobalt sulfide or the azo-dye techniques (Fig. 29). The reaction is localized in the non-nervous cellular elements around the nerve filaments which are themselves unreactive. All of these end-organs have an enzyme reaction, but the concentration varies among them and from individual to individual.

The endothelium of the superficial capillaries and the larger and deeper blood vessels of the clitoris are so strongly reactive for alkaline phosphatase that vascular patterns can be studied



Figure 28. Non-specific cholinesterase activity in the mucocutaneous end organs in the human clitoris. (X100).

clearly in these preparations. There seems to be no relationship between these sensory end-organs and blood vessels.

Having made these observations, what conclusions can we draw from them? The significance of the alkaline phosphatase in the muco-cutaneous end-organs is conjectural. The presence of the enzyme in the extraneural substance may be of metabolic significance or it may play a role in the propagation of impulses. We do not know if other muco-cutaneous end-organs have properties similar to those of the genital corpuscles. This points out again the need of more such information on the tissues of man.

In summary, alkaline phosphate activity was found in the muco-cutaneous end-organs of the human clitoris and appears to be restricted to the non-neural substance surrounding the coiled nerve filaments. The distribution of the alkaline phosphatase in the sensory end-organs corresponds with that of the nonspecific cholinesterase.

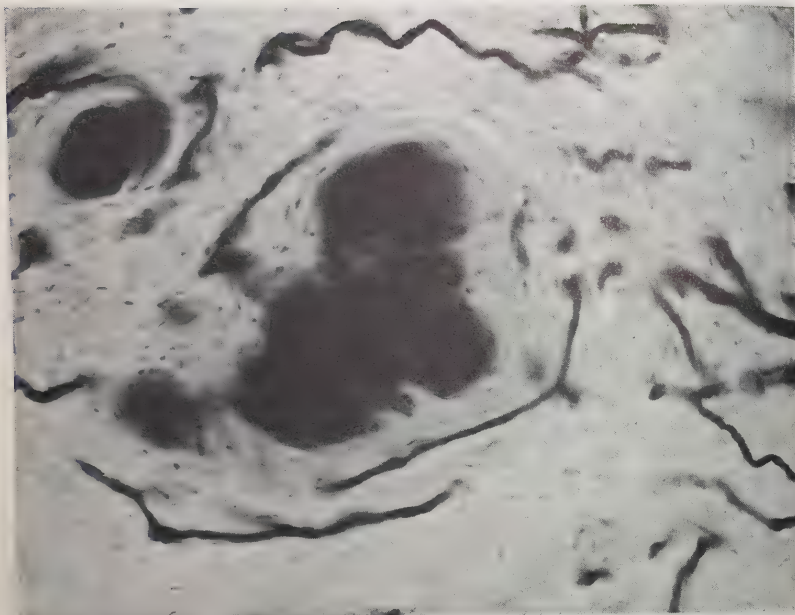


Figure 29. Field from the dermis of the human clitoris showing a positive alkaline phosphatase reaction in a mucocutaneous end organ. (X250).

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Chapter VII

SOME ISSUES IN THE HISTOLOGY OF THE CLITORIS

Thomas P. Lowry

The traditional view is rather simple: the clitoris contains a large number of specialized nerve endings (including "genital corpuscles") which receive erotic stimuli and transmit them to the rest of the body, producing pleasure and, perhaps, orgasm. Further basic assumptions are that the skin (and deeper structures) contain receptor organs, visible under the microscope, which are specific to receiving various external stimuli, and that in all women these are concentrated in the clitoris. Like most arcadian notions, these have proved to be not quite the truth.

The classic "specific receptor" anatomy is illustrated in Fig. 30. The bulbs of Krause perceive cold. The receptors for heat are Krause-like structures, or perhaps are the end-organs of Ruffini. Touch is perceived by Merkel's tactile discs, Meissner's touch corpuscles and the fine nerve endings around hair roots. Pain is a function of the free nerve endings. Pressure is perceived by the corpuscles of Pacini (Vater-Pacini). Pacinian corpuscles in the genitals and nipples are the "genital corpuscles" (1, 2, 3).

However, many of the encapsulated receptors are fundamentally similar in their structure (a special connective tissue capsule surrounding the actual nerve ending) and show such variations of size and complexity that in actual life it is often hard to classify a particular receptor into any of the types shown in the illustration. Further, recent experimental evidence makes it more difficult to equate one receptor to one sensation. Indeed, as Rose and Mountcastle (4) point out there are now at least three schools of thought: the classic school with specific receptors receiving only certain stimuli, the Oxford "pattern" school, which almost denies any specificity, and the Head school, which divides neural receptors into primitive and specific, the so-called protopathic theory.

This is where things stood ten years ago before the electron

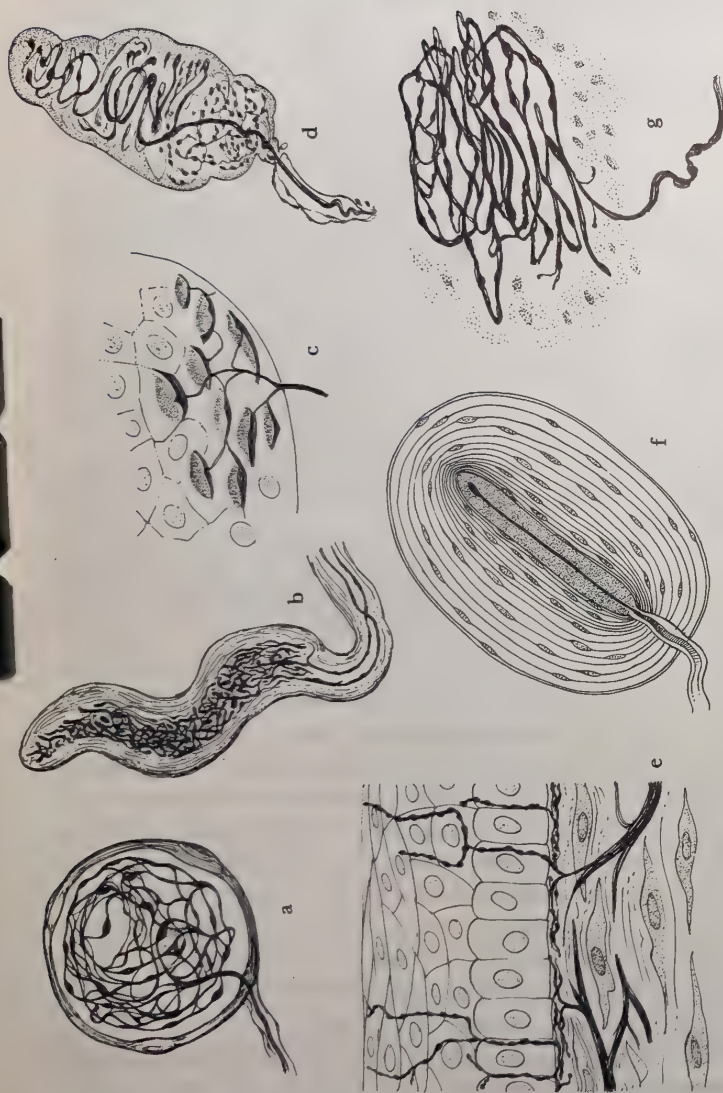


Figure 30. The principle cutaneous receptors: a. bulb of Krause; b. organ of Ruffini; c. Merkel tactile discs; d. Meissner touch corpuscle; e. free nerve endings; f. corpuscle of Pacini; g. mucocutaneous end organ. Redrawn from various sources, by Steve Gilbert.

microscope overturned much of classical histology, with advances in precision so great that students who graduated a decade before this one can hardly recognize the new anatomy. The changes can well be compared with those in Martian astronomy, which went from vague blurs glimpsed through the pulsing atmosphere (with the traditional alarms of canals) to the stark clarity of craters photographed from a passing spacecraft.

In genital histology, in spite of improved techniques, confusion has reigned. Experts disagree with experts, even disagree with themselves. In 1945, Weddell published a photograph of endings in the skin of the forearm purporting to be Krause end-bulbs, but in 1953 retracted this interpretation. In 1957, Winkelmann (5) made a thorough study delineating the "mucocutaneous end-organ," which he described as loops of nonmyelinated nerve fibers, rolled on one another in a spherical mass about 1/20th of a millimeter in diameter, with no specialized connective tissue capsule. These were widely distributed in the subpapillary layers of the dermis of the glans penis, prepuce, lip, tongue, eyelid, and perianal region. They were most concentrated in the clitoris and were absent in the nipple. He concluded, "...one cannot expect that a specific genital sense exists. If a specific function does exist for the mucocutaneous end-organ, it would not be surprising if this would be the perception of acute touch."

However, the same author (6) writing ten years later in a massive electron microscope atlas of skin anatomy, describes only four special nerve endings: Merkel Cell, Meissner Corpuscle, Vater-Pacini Corpuscle and Mammalian End Organ, which he states is found "...in almost all mammals..." while he defined the mucocutaneous end-organ as confined to primates. How hard it must be to abandon one's fondest creations, but the anatomist today must be prepared to do just that. *Sic transit gloria anatomii*.* The changes in this field are more than in

*In a recent letter, Winkelmann states, "In *Comparative Biology of Primates*, edited by Buettner-Janush, I pointed out that the mucocutaneous endorgan and the Meissner corpuscle become more and more alike as one descends in the primate scale. This was the reason I did not emphasize the mucocutaneous endorgan in Zelickson's book."

anatomy alone; the chemists now deal with individual cells and intracellular parts, as seen in Dr. Giacometti's chapter in this book.

The specificity of at least one receptor, the Pacinian corpuscle, seems beyond doubt. It responds to pressure (in fact, will react to a displacement of less than a thousandth of a millimeter, delivered in a ten thousandth of a second) and reacts very little to warmth and to acid. This exquisite sensitivity is important to this discussion, since according to at least one author, the Pacinian corpuscle is the dominant receptor in the clitoris.

Another traditional belief in clitoral histology is that the clitoris uniformly contains the genital area's greatest concentration of receptors. This idea is discredited by the work of Krantz (8). After reviewing the enormous literature on genital morphology (where contradictory findings are compounded by much of the earlier work having been done on non-human species) he reported his own study. He fixed and sectioned the genital tracts (clitoris, labia minora, labia majora, perineum and entire vagina) of eight human females, ranging in age from an 8-month fetus to a 55-year-old woman, and made a meticulous microscopic study. In the vagina, he found only a few free nerve endings. The hymeneal ring had a few more free nerve endings and an occasional Merkel disc. The mons veneris and the labia majora both had large numbers of Meissner corpuscles, Merkel discs, Pacinian corpuscles, free nerve endings, Ruffini corpuscles and Krause corpuscles, and, of course, were the only areas with peritrichial endings, since the other areas are hairless. The labia minora had moderate amounts of Meissner, Merkel, Pacini, Ruffini and free nerve endings; Krause corpuscles were the most common element found.

The clitoris, by contrast, had only small numbers of receptors subserving touch (Meissner and Merkel), but enormous numbers of Pacinian corpuscles and large numbers of Ruffini, Krause and free nerve endings. These same findings were also true of the clitoral prepuce. The greatest number of receptors were found in young adults; in the fetus, the receptors were relatively undifferentiated, while in the oldest specimen, there were decreased numbers.

Krantz' findings confirm the relative insensitivity of the vaginal lining (but cannot clarify the pubococcygeus kinesthetic receptor controversy). They also confirm the *usual* vulvar receptor distribution. However, Krantz found a wide variation in the quantity, quality and location of the various nerve endings; in one of the eight specimens, there were almost no receptors in the clitoris, but many in the labia minora. Such a distribution would seem quite likely to produce a non-clitoral sexual sensitivity and a difference in preference in sexual technique. If the one out of eight distribution holds up for the general population, then the United States has twelve million women (of all ages) who have an anatomical pattern of non-clitoral vulvar sensitivity.

Krantz' work confirms, histologically, what was reported by Kinsey (9) in 1953. Table IV summarizes these results, which were based on a total of 879 women, examined by five experienced gynecologists (2 female and 3 male). They touched the women, in the areas designated, with a smooth probe and the subjects reported when they felt a touch. The tests of vaginal sensitivity were done through a speculum, with care not to touch the outer structures. In the table, a plus indicates response, while a zero indicates none. Kinsey suggests that while the ability to feel touch cannot prove that an area is erotically responsive, it seems hardly probable that an area insensitive to light touch would be sensitive to erotic sensations. It is clear from these results that the labia are as sensitive as the clitoris, especially the lesser lips.

In summary, the clitoris contains, in most women, a large number of receptor nerve endings; in some women, other areas may contain more. In almost all women, the labia minora are also highly sensitive. Different neuronal patterns may produce different sexual preferences. The correlation between the anatomic appearance of a receptor cell and its actual function is often unclear. The existence of a "genital corpuscle" remains unproved. The work of the last century of microscopic genital anatomy needs to be redone, using the electron microscope and cytochemical techniques.

TABLE IV

Structures	Percent Responding	Total Number of Cases	Typical Variation in Response in 15 Cases														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Labia majora Right Left	92	854	0	0	+	+	+	0	0	+	+	+	+	+	+	+	0
	87	854	0	0	+	+	+	0	+	+	+	+	+	+	+	+	0
Clitoris	98	879	+	0	+	+	+	+	+	0	+	+	+	0	+	+	+
Labia Minora Right, outer surface Right, inner surface Left, outer surface Left, inner surface	97	879	0	0	+	+	0	+	+	+	+	+	+	0	+	+	+
	98	879	0	0	+	+	0	+	+	+	+	+	+	0	+	+	+
	95	879	0	0	+	+	0	+	+	+	0	+	+	0	+	+	+
	96	879	+	0	+	+	0	+	+	+	+	+	+	0	+	+	+
Vagina Right Wall Left Wall	14	578	0	0	0	+	+	+	0	0	+	+	0	0	+	0	0
	14	578	0	0	0	+	+	+	0	0	+	+	0	0	+	0	0

Modified from Kinsey, A et al: *Sexual Behavior in the Human Female*, Saunders, Philadelphia, 1953, with permission of the Institute for Sex Research, University of Indiana.

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PATHOLOGY OF THE CLITORIS

Thomas G. Morrione and Thomas P. Lowry

The clitoris is subject to the ills that beset other organs, but being able to respond specially to the stimulation of steroid hormones, it has some unique to itself. This discussion will divide clitoral pathology into two main areas: neoplastic and non-neoplastic.

The latter include trauma, hormonal influences and chromosomal abnormalities. A British surgeon (1) reported an eleven-year-old girl who appeared with severe swelling of the upper vulva. Examination under anesthesia showed a sewing thread tied tightly around the clitoris and prepuce. Later, she admitted tying it there, but gave no reason. The surgeon concluded, "It is interesting to note that for homework, she had to write an essay on 'life in hospital.' We may assume that her brief visit to the Radcliffe Infirmary would add considerable local colour to this literary effort. Should this young lady contemplate taking up surgery as a career, her ability to tie knots in any situation would be, I think, unchallenged." A more common cause of trauma is the chafing of the center pants seam during horseback riding; the same frictional action has on occasion also yielded more pleasurable results.

Most women have one clitoris; some have two. One case was that of a four-pound newborn with many congenital abnormalities (2). Pregnancy was uneventful. There were two vulvas, each with a clitoris. Cases of single vulvas with bifid clitoris have been published in England (3) and Holland (4). A case which defies ordinary embryological explanation is one in which there were two clitorides, one above the other, in a woman otherwise normal (5).

Enlargement of the clitoris can be due to at least eight different conditions; recently full discussions of causation and differ-

ential diagnosis have been published (6, 7). The antique literature reveals how much has been clarified: in 1837 (8) a married woman, age 25, had enlarged labia and clitoris. The surgeon blamed it on gonorrhea; she blamed a kick received four months before. At surgery, she nearly bled to death. In 1849 (9) a woman who had died of fever was found to have a clitoris with a urethra in it; ovaries, uterus and vagina were present. *The Lancet* reported (10) elephantiasis of the clitoris, with a growth the size of "a very large cocoanut." The role of the filarium was unknown then; the discussion centered around why "... the women of the South Sea Islands, although repulsive in their habits, are rarely affected with such enlargements."

Other more recent studies (11, 12, 13, 14) reflect the growing awareness of how to distinguish the various causes of clitoral hypertrophy: congenital adrenal hyperplasia, adrenal tumor, maternal virilizing disorder, iatrogenic (from hormones given to pregnant women), true hermaphroditism, asymmetric gonadal dysgenesis and male pseudohermaphroditism. Bruzzone's studies with castrated female guinea pigs, who received testosterone and developed clitorides like hypospadiac penises, illustrate some of the experimental biology which has clarified these issues (15).

The last decade's progress in chromosomal analysis now leads to more precise and numerical diagnoses. The Poles have been very active in this area of research. One case was diagnosed as Turner's syndrome with phallic enlargement (16); there was no Y chromosome or Leydig cells in the medulla of the gonad. The diagnosis was 45 XO karyotype. They later reported (17, 18) cases of pure gonadal dysgenesis with hypertrophy of the clitoris and 46 XY karyotype. They further defined this as "... a syndrome in phenotype women with eunuchoidal body proportions, infantile external genitalia and streak gonads."

Bowen *et al.* (19) reported a puzzling case with no karyotype abnormality. In two unrelated pairs of sibs, there was congenital glaucoma, joint contractures and hypertrophy of the clitoris. Homozygosity for a recessive gene is proposed as the cause. Ehrenfeld (20) reported two males with enlarged clitoris. Both were female phenotypes and had been raised as girls, but had male nuclear sex chromatin patterns. The clitoral enlargement

was congenital, as there were no other androgenic features; the diagnosis was gonadal dysgenesis.

Kriss (21) reported three cases of what he called acute cavernitis clitoridis; there was one case each of infection by streptococcus, staphylococcus and gonococcus. Pilonidal cyst, whose exact origin seems open to debate, has been reported three times as occurring in the clitoris (22, 23, 24).

The area of neoplasm reaffirms the need for exact diagnosis. Haddad (25) reported three cases, originally diagnosed as pseudohermaphroditism, which turned out to have tumor, instead, namely a lipoma, a hemangioendothelioma and a neurofibroma.

Carcinoma of the vulva is the fourth most common female genital cancer. Following labia minora and majora, the clitoris is the third most common site of origin. The usual metastases are to the superficial and deep inguinal, the femoral, iliac and the hypogastric lymph nodes (26). There are at least five articles describing cases of primary carcinoma of the clitoris (27, 28, 29, 30, 31) and two describing secondary carcinomas there (32, 33).

A wide variety of other tumors have been reported in the clitoris, many in the literature outside the United States. A rather incomplete survey includes fibroma (34, 35, 36), epithelioma (37, 38), granular cell myoblastoma (39), leiomyosarcoma (40), melanosarcoma (41), melanoblastoma (42), glomus tumor (43), neurilemmoma (44), teratoma (45), cyst (46), and keloid (47). A case from the Philippines (48) of induration of the clitoris proved to be granulocytic leukemia.

Diekmann *et al.* (49) reviewed sixteen cases of childhood von Recklinghausen's disease; diagnosis is most difficult since often only pigment spots are present, not the typical cutaneous and nerve tumors. A nine-year-old girl had, as her only manifestation of neurofibromatosis, pigmentation of the vulva and marked enlargement of the clitoris. Barros (50) reports neurofibromas the size of hens' eggs, in the clitorides of two women; his illustrations show an excellent post-surgical cosmetic result.

One thing worse, perhaps, than a diseased clitoris, would be none at all; three cases of clitoral absence have been reported—

one in Roumania, in 1938, one by Dickinson (52), and one in 1971 in Manhattan (51). All other cases have been part of a syndrome of extrophy of the bladder, with the clitoris usually bifid and displaced laterally. The patient of Falk and Hyman was an otherwise healthy 25-year-old woman, with no midline pubic hair and a gaping urethra; she did have erotic sensation at the upper end of each of her widely separated labia minora. The authors concluded that, embryologically, she had just missed having extrophy of the bladder.

In summary, the clitoris can be affected by almost every possible illness or malformation.

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SURGERY OF THE CLITORIS

A. Stark Wolkoff

The gynecological aspects of the clitoris, when compared to the mythological or psycho-physiologic features, are very modest indeed. This small organ, almost vestigial in the female, frequently designated as the analogue of the penis in the male, has achieved recently almost unjustifiable importance.

Anatomically, there is much similarity in the two organs as has been described in the chapter on anatomy, but functionally there is very little similarity. Erectile tissue based on hydraulic mechanisms using blood as the fluid force accounts for the erection and sexual similarity, but the functional likeness stops there. No sound consensus can justify the comparability of the functional similarity of these two structures. Though both are utilized in sexual activity, penetration demands the utilization of the erect penis by the male, but frequently the clitoris has no function in the female including that of sexual activity.

It is axiomatic that plastic surgeons do not attempt to construct or restructure a clitoris to simulate the organ of the male except in highly questionable cases of interest where even a large, or hypertrophied clitoris is more acceptable "as a penis" than no such structure at all. The clinical problem of intersex is one such instance.

In a discussion of the diseases associated with the clitoris the classic approach of anatomical, physiological, surgical, inflammatory, and neoplastic can be utilized and most textbooks briefly enumerate these conditions. The anatomical and physiological notations have already been stated. The surgical problems are few and the knowledge and skill to handle such problems are not difficult to acquire. A brief outline is presented:

SURGERY OF THE CLITORIS

- I. Procedures
 - A. Excision
 - B. Circumcision
 - C. Plastic repairs
 1. Release of "hood" adhesions
 2. Reduction in size
- II. Treatment
 - A. Infections
 1. Venereal
 2. Non-venereal
 - B. Neoplastic
 1. Benign
 2. Malignant
- III. Traumatic

The simplicity of the outline is based on a fairly large clinical experience over a 20-year period in large indigent and university clinics. The omission of reconstructions of the urethra and vagina is done to focus on the actual surgery of the clitoris. Frequently, such surgical procedures utilize hypertrophied clitorae for the purpose of reconstructing urethral and other defects of the external genitalia, but so rarely that it is not within the scope of this work to elaborate on the already large literature available for such plastic repairs.

EXCISION

The excision of the clitoris is a simple procedure which follows general surgical procedures involving any polypus (1). An elliptical incision is made starting well above the base and terminating well below. The incisions are joined and carried down through the subcutaneous tissue to the fascia and periosteum overlying the symphysis. Undercutting is carried on utilizing center traction. Hemostasis is controlled with individual hemostats, clamps and suture. With careful dissection, the actual clitoral artery and vein can be skeletonized and handled separately. Ap-

proximation by layered closure with a subcuticular or horizontal mattress suture of fine nonabsorbable material in the skin produces an acceptable result.

CIRCUMCISION

The technique for this ancient and overly glorified procedure is similar to that done on the penis (2). The important feature is separating the synechiae or adhesions of the foreskin over the glans. This can be done by a fine probe or Keith-straight cutting edge needle. After the foreskin moves easily over the glans, the skin can be excised and the excised end approximated above the glans to the superficial tissue with interrupted fine catgut sutures. A small plastic bell can be used if the clitoris is large enough to facilitate the excision. The concept of utilizing this procedure to enhance clitoral sensation in cases of sexual problems and frigidity has been much overrated in this writer's opinion. The idea that excitation is enhanced by exposing the glans is not based on anatomical or physiological evidence. There is much evidence recently gathered that erotic sensation is predominantly conditioned, and the approach to inadequacy or frigidity by circumcision is deplorable. Further, the concept that labial and clitoral size can be equated to the degree and frequency of masturbation should also be put to rest. The facts absolutely deny this statement made so frequently in the older, and unfortunately, even more recent literature.

The use of circumcision and clitoridectomy to reduce sensation in youthful and perhaps too exuberant wives by primitive and ancient cultures is also not based on physiological reasoning but may have its empirical acceptance on the probable resultant inflammation, ulceration, abscess and scar tissue that would result from such a procedure. Such a miserable set of circumstances obviously resulted in reduced sensation and lowered erotic feeling in the involved parts because of the associated pain and discomfort accompanying coitus after such mutilation.

PLASTIC REPAIRS

The most frequently met conditions involving the clitoris is that of synechiae or adhesions between the glans and hood. The adherence of these structures results in trapped or inspissated material designated smegma containing oil and secretions from sudoriferous and sebaceous glands in the skin. Infection from poor vulvar hygiene frequently results in irritation which drives a patient to her gynecologist. The dried out kraurotic conditions found in menopausal women can also result in infection from the poor barrier the senile skin makes to the invading or pathologic bacteria.

Culture and antibiotic sensitivity studies on the exudate followed by suitable systemic antiobiotic and hot soaks is all that is usually required. It is advisable not to use topical antibiotics, analgesics or other nostrums. After the inflammation has subsided a probe-like instrument can be used to sweep aside the troublesome synechiae. This procedure is rarely of sufficient consequence to hospitalize the patient. Systemic analgesic and local anesthesia will generally suffice.

Another occasionally troublesome entity is hypertrophy of the clitoris which is troublesome to the patient. This is usually seen when the clitoris can be seen under tight fitting clothes, particularly bathing suits or shorts. If the patient does not complain of this feature but merely seeks reassurance that her large clitoris is not abnormal, the distinction should be made. A sensible approach is to perform surgery on those that are obviously a problem with tight fitting clothing. Formerly, amputation was the procedure resorted to, and even now is certainly acceptable under some circumstances. If after a complete work up and with the reassurance that there is no genetic or organic disturbance in hormonal function, the surgical approach can be utilized.

Simple excision is performed as previously described by an elliptical incision at the base of the clitoris followed by plastic closure over the amputated site when hemostasis is complete. Reduction in size (3, 4) can be done by a slab incision, proximal to the glans, removal of skin at the incision site, and transverse reapproximation which shortens the clitoris without removal of

tissue other than minimal skin. The result is a broad base which is more acceptable aesthetically, and certainly decreases the embarrassment of the large erected clitoris which is the chief complaint and for which the patient seeks relief.

TREATMENT OF INFECTION

The infection of the external genitalia which includes the clitoris, of course, must include the venereal group. Syphilis, which is usually identified as a chancre, appears on or near the clitoris in a significant number of primary cases. The identification is made by the appearance of the treponema pallidum when the exudate from the chancre is visualized under dark field microscopy. Serology is utilized in later syphilis and the secondary lesions rarely, if ever, involve the clitoris. Gumma have been reported about the labia and clitoris. The more esoteric lesions of lymphopathia venereum are rarely, if ever, seen because the lymphatic drainage of the labia and clitoris is away from the midline. This also applies to lesions of granuloma inguinale. The lesions of herpes progenitalis and other D.N.A. viruses rarely are seen about the clitoris although such viral ulcerations are frequently seen about the labia. Condylomata accuminata has been observed about the clitoris especially in young women who have neglected large exophytic lesions about the labia.

The other infections about the clitoris usually observed clinically are ulcerations and edema of mixed bacterial origins.

The treatment of all such lesions depends on the etiologic agent and sensitivity studies. Cold and hot compresses usually suffice for local treatment. Because of contact and atopic dermatitis, salves and nostrums applied directly to the ulcerations can result in eczematous lesions worse than the original ones.

NEOPLASTIC DISEASE

The presence of malignant disease involving the clitoris can be primary or metastatic. Usually, the lesion is squamous cell carcinoma arising in the covering mucosa. Whether the causation is repeated infection or ulceration from minor trauma, or carcino-

gens applied by sexual contact is not definitely known. Basal cell carcinoma and the spectrum of sarcomatous lesions have all been reported involving the clitoris and receive undue notice because of the mystique of the organ. A similar lesion of the vulvae is rarely reported in recent literature because of the relatively high incidence.

The treatment for these lesions, no matter the grade or stage of the malignancy, is radical vulvectomy with superficial and deep groin dissections. The deep pelvic nodes are removed, if there are positive nodes in the groin, by a later operation. Malignant melanoma arising in simple or junctional nevi are treated by radical vulvectomy as above, but more extensive surgery, such as hemiamputations involving the torso, is not undertaken.

Non-malignant neoplasms identified as such by excisional biopsy are treated by the biopsy at least and simple vulvectomy at most.

TRAUMA

The frequency of traumatic lesions has not been well recorded because of the multiplicity of causative events. The chronological classification can be used and the prepubertal, postpubertal, adolescent, adult and menopausal time periods can serve as a satisfactory timetable.

PREPUBERTAL TRAUMA

Penetrating wounds in the clitoral area from falls against objects or stabbing wounds by sex deviants are the most frequently observed events. The usual surgical care of penetrating wounds is applied: stop hemorrhage, debride the wound area, cleanse with sterile solutions, suture primarily if possible, and protect the patient from infection by suitable antibiotics and anti-tetanus toxoid.

POSTPUBERTAL TRAUMA

A similar statement applies to this age group except the de-

gree of lacerating and penetrating wounds is more severe. It is probably advisable to shave the pubic hair for better exposure of the wound site and easier suture application. This group as well as that of the adolescent and adult have the additional problem of human bite wounds in this area, which frequently require wound healing by secondary intention. The additional problem of gun shot wounds to secondary sex organs has also been occasionally seen and as with carnal attacks must be reported to the proper authorities. The treatment of such deep penetrating wounds frequently involves exploration of the pelvis and abdomen for missile perforation of gut or other visceral organs. Orthopedic procedures for bone involvement must also be considered.

The menopausal female has the additional problem of poor wound healing and atrophic skin about the involved area and necessary estrogenic stimulation and vitamin supplementation is advisable.

As a suitable closing statement it must be remembered that the diagnosis and management of lesions of the clitoris are complicated by the ignorance and special emphasis attached to this organ. If the veil of secrecy and confusion is removed, the evaluation of the problem and the preferred modality of management is almost without exception abundantly clear.

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Chapter X

AN ANTHROPOLOGICAL VIEW OF CLITORAL AND OTHER FEMALE GENITAL MUTILATIONS

Ben R. Huelsman*

INTRODUCTION

After more than a century of investigations among the peoples of the world, physical anthropologists and medical observers still lack much basic data about human genitalia! Information not accurately known about the comparative anatomy of the females of various ethnic groups includes the size and configuration of the clitoris, its varying lengths and positions in relation to the vaginal opening and the meatus, and the appearance, size and shape of the outer and inner labia. Among males of differing ethnic and racial groups, little can be accurately stated as to the length and circumference of the penis, both flaccid and erect.

In the United States in a sample of one hundred adults, the clitoral glans size averaged between 4 and 5 mm. in the transverse and longitudinal axes (17). For non-white females, far less firm and contemporary data can be adduced. In the search for comparative descriptive data on non-white females, the reader is forced to follow a tortuous path among the stacks of medical and anthropological libraries. The dust-covered works of writers of 5, 6 and 7 decades ago provide some of this data, along with misinformation and hypotheses of dubious value. An anonymous French Army surgeon in 1898 claimed after years of travel in Africa that the Negress on that continent was more greatly developed than the white in clitoral dimensions. He offered no photos, drawings or detailed measurements to sustain his theory, however (1). Moreover, he failed to distinguish between tribal

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groups in which the clitoris occurred naturally large and tribes in which artificial elongation of the clitoris was practiced.

Independent of the French surgeon, an American medical observer, Morriss, noted a seemingly racial variation of a different kind in the clitoris (38). He estimated that eighty percent of the "White Aryan" patients known to him possessed a clitoris in which the glans clitoridis and the prepuce were bound together by adhesions. While making no claim to having done field work in Africa, he did offer the theory that adhesions of the clitoris among black females were rather rare, but that he had seen at least some among individuals of mixed blood, presumably a reference to mulattoes in this country. By naively implying that white women represented the highest level of evolutionary development among the major races, he then offered the fascinating hypothesis that if his observations on clitoral "degenerations" among white females were correct, then Nature must be trying to abolish the clitoris as civilization advances! Morriss began a valuable line of research by citing the prevalence of clitoral adhesions, however, and subsequent medical investigators in the United States have confirmed his reports of clitoral adhesions. This will be taken up in more detail later, but it can be pointed out here that adhesion is the current medical rationale given for female circumcision, along with clitoral hypertrophy and the so-called hooded clitoris. It is by no means clear from the somewhat separate literatures of anthropology and medicine whether adhesions occur with the same prevalence among women of various racial and ethnic groups.

My original intent was to assemble the anthropological data on female genital mutilations, to speculate as to the possible origins of such customs and to offer a critique of the existing classifications of these practices as they still persist in the pre-literate and non-Western worlds. However, during the course of this research, which led to the examination of many medical journals from the dates of their inception (e.g. *The Lancet*, which began in 1825), I realized that the history of surgical operations on the clitoris in Western civilization was equally obscure and quite separate from the female genital operations prevalent among non-Western peoples. In fact, a larger literature

exists on these practices among primitive peoples than is true of the medical literature on surgical alterations of the female pudenda in the Euro-American nations.

CLASSIFICATIONS OF FEMALE GENITAL MUTILATIONS

The modern science of cultural anthropology was still in the developmental stage during the first half of the nineteenth century. Beginning three centuries earlier travellers, traders, soldiers, physicians and missionaries began describing the ways of life they encountered in aboriginal cultures. One of these accounts, by an English physician (14) in 1847, offers one of the first scientific attempts to describe and classify the varieties of female genital surgery then prevalent in Africa. Daniell saw some, but not all, of the kinds of female genital operations now known to have existed in Africa, and he felt that such genital operations could be grouped into four headings:

1. Simple excision of the clitoris.
2. Excision of the nymphae.
3. Excision of both the nymphae and the clitoris.
4. Excision of a portion of the labia pudendi, with either or all, of the surrounding structures.

He evidently did not travel to either Egypt or to the Sudan, for had he done so, his classification of pudendal alterations would have included vaginal infibulation and Pharaonic circumcision, sometimes referred to inaccurately as "Sudanese circumcision." Daniell also noted that such operations upon African girls were always performed by old women of the same tribe, a fact which was continuously confirmed by later generations of ethnographers who have studied genital surgery in Africa south of the Sahara, hereafter referred to as SubSaharan Africa. Daniell also informed his readers of the variation in age at which such operations took place. In West Africa, ages ranged from four to nine years; in North Africa eleven to twelve years of age was more common, some girls not being genitally altered until about age sixteen, or even older. From the first-hand accounts of Daniell it is already possible to deduce that not all forms of

female genital operations occurred in association with puberty ceremonies, or as they later came to be styled, rites of passage.

The literature of anthropology has increased enormously and many other regions of the world have been studied since Daniell gave his early account. Descriptions of genital operations abound in the literature of anthropology; however, in the opinion of one critic (22) these accounts generally do not specify in sufficient detail just what surgical alterations are involved. Ford indicates that in many ethnographies the term clitoridectomy is frequently used as an undefined word signifying some kind of operation on the clitoris. From my own survey of this literature I feel that Ford is quite justified in his criticism of this fuzziness in ethnological descriptions. The reader often cannot tell whether or not the term refers to removal of the entire clitoris, its incision, and whether or not the sheath and/or glans has been removed. He feels that it is important to determine precisely what the operation consists of, as well as its effects upon the organ which has been surgically altered, and further that it would be desirable to know the significance any given people attach to the effects of genital surgery. He is correct in asserting the value of obtaining highly accurate photographs or sketches to supplement the narrative accounts elicited in the field and in clinics and hospitals, where accurate medical records are apt to be kept.

Another anthropological critic of the vague terminology in both medical and ethnographic writings on genital surgery (48) not only deplores the quagmire of confusing, interchangeable terms, but even suggests that the term circumcision should be applied exclusively to operations on the penis, if indeed this term is to be employed at all. Sometimes an author uses the word excision, or as Daniell called it, simple excision, to refer to the removal of the prepuce, glans and shaft of the clitoris. Others call this same operation clitoridectomy or cliterotomy. At other times, depending on the individual observer and his preferred terminology, the phrase female circumcision is used generically to include all possible forms of female genital operations.

I feel female circumcision is a useful term but that it should be restricted to that type of operation upon the clitoris in which

only the prepuce of that organ is removed, preserving the glans, the shaft of the clitoris and the surrounding labia. In the areas of the Arabic/Muslim world where this custom persists, the operation is called Sunna circumcision.

Terms like female circumcision and Sunna circumcision are interchangeable, but only if each is explicitly defined. The existing literature, seldom in agreement as to labels, must be carefully sifted for internal contradictions because of the overlapping terminology. One of the most thorough accounts of female genital operations in 19th century Africa (43) is generally commendable in overall descriptive precision. Nevertheless, Roles in a collective account of all types of such operations in the area feels able to refer to these practices as "types of female circumcision in the XIXth century." I have incorporated the listing of such tribes practicing the varieties of female genital surgery, the account being based in part upon Roles and incorporating information from other authors. Table V gives a comparison of the earlier Daniell classification with the nearly equivalent terms of Roles.

TABLE V
COMPARISON OF FEMALE GENITAL MUTILATION CLASSIFICATIONS

Daniell (1847)	Roles (1966)
1. Simple excision of the clitoris.	1. Clitoridectomy.
2. Excision of the <u>nymphae</u> .	2. Clitoridectomy and removal of the labia minora.
3. Excision of both clitoris and <u>nymphae</u> .	3. Clitoridectomy, with removal of labia minora and majora.
4. Excision of a portion of the labia pudendi, with either or all of the surrounding structures.	

Types 1 and 2 of Roles were, and still are, the most commonly employed kinds of female genital operations in tribal, or Sub-Saharan East Africa. This non-Muslim area is characterized by a high development of rites of passage for both sexes and young males must undergo circumcision by an older tribesman. Al-

though not identical, these two classifications, despite nearly 120 years' separation in time, are quite comparable. The fact that neither deals with Sunna circumcision or vaginal infibulation is probably due to the authors' desire to concentrate upon non-Muslim areas of tribal East Africa, where these two kinds of operation are usually absent.

One well-known pair of anthropological writers (41) considers female circumcision and infibulation as quite distinct types of female genital operations. Excision is seen as synonymous with female circumcision, but under the latter, which they define as the shearing of the inner lips and a portion of the clitoris with knives of metal or stone, they regard a widely differing set of surgical procedures as also constituting female circumcision. These are: mutilation of both labia and clitoris, sometimes only the labia and at other times only the prepuce of the clitoris.

One of the most comprehensive studies of female genital operations has been done by a Sudanese gynecologist (44). This work of Shandall also contains the most closely refined definitions of the discrete kinds of operations. I have made only one addition to the typology of Shandall, adding a Type 2a, circumbustion, a term coined by the late Felix Bryk in his *Voodoo Eros*. Except as noted before, the following classification and comments are those of Shandall:

Type 1: Circumcision

This is analogous to that of the male. It consists of the removal of the prepuce of the clitoris only, preserving the clitoris itself and the posterior larger parts of the labia minora. It is the variety advocated by most authorities on Islam and is called *sunna circumcision* in Muslim countries. The Arabic word *sunna* means circumcision.

Type 2: Excision (or reduction)

This consists of removal of the prepuce and glans of the clitoris, together with the adjacent parts of the labia minora, or the whole of it, without including the labia majora and without closure of the vulva. This was the commonest type in

— Egypt before prohibition and is now taking the place of infib-

ulation in the Sudan since the legislation of 1946 prohibiting the latter.

Type 2a: Circumbustion

The removal of the entire clitoris by means of charring; a glowing coal, placed in a spoon, is the agent by which the charring of the clitoris is accomplished, among the Nandi, an Eastern Hamitic people of Northeast Africa (10). During male circumcision ceremonies among the Nandi, the prepuce is also removed by circumbustion.

Type 3: Infibulation

This is really excision plus infibulation. It is the commonest type in the Sudan, where it is known as "Pharaonic Circumcision." It used to be practiced in Egypt, mainly Upper Egypt, and was there called "Sudanese Circumcision." Being known to the Ancient Egyptians, it probably entered the Sudan through the north from Egypt and "Pharaonic" is a justified name. In this type the whole of the clitoris, the whole of the labia minora and the adjacent medial part of the labia majora in their anterior two-thirds are removed. The two sides of the vulva are then brought together by silk or catgut sutures, obliterating the vaginal introitus except for a small opening posteriorly to allow urine and menstrual blood to come out. In the past, a clasp of split cane was used to control the bleeding and bring the two sides together. In Somaliland, thorns are used to fix the two sides together and the wound is dressed with myrrh.

Type 4: Introcision

At puberty the vaginal orifice is enlarged by tearing it downwards with three fingers bound round with opossum string. The operation is usually performed by an old man trained for the job. In some districts the perineum is split up with a stone knife. This is followed by compulsory intercourse with a number of young men, and sometimes with the older men of the tribe to rejuvenate them, in a big tribal ceremony. This is practiced only in aboriginal Australia.

DISTRIBUTION OF TYPES OF FEMALE GENITAL MUTILATIONS

The geographic distribution of the various kinds of operations on the female pudenda is quite revealing. In aboriginal North America, north of Mexico, puberty rites were a component in many Indian cultures, yet no female genital operations have ever been reported for the area. It is generally believed that the ancestors of all New World Indians, including the Eskimos and Aleuts, crossed the Bering Strait land bridge at least 12,000 and perhaps as long ago as 30,000 years ago.

In South America in the eighteenth century, Father Xavier Veigl learned that the Indians of Pano linguistic stock in Ecuador had been in the habit of circumcising their girls in order to allegedly make them more competent in their marital duties (37). It is also reported (36) that infibulation of the female existed among the Conibo Indians of the Rio Ucayali in Peru. Citing the work of the German ethnographers Reich and Stagellmann, Montagu offers this account of an apparently authentic instance of female infibulation in the New World:

As soon as a girl attained to mature age, a great feast was made in which a fermented drink made of manioc roots, called *maschato*, played an important part. After the girl had been made so intoxicated by this beer that she was quite unconscious, the operation began. She was stretched out on three poles of *palo de balsa*, and in the presence of the whole noisy assembly an old experienced woman cut around the *introitus vaginae* with a knife of bamboo and severed the hymen from the *labia pudendi* so that the clitoris was set quite free. The old sorcerers rubbed some medicinal herbs into the bleeding parts, and after a while introduced an artificial penis, made of clay, into the vagina of the maiden, the thing being exactly the same size as the penis of the man betrothed to her. Thereafter she was considered properly prepared to marry, and was given over to her future husband.

Montagu adds that this operation differs from that customary in North Africa only in minor details, e.g., in the latter area the clitoris is normally removed during infibulation and the girl is customarily conscious during the proceedings. He is correct in

citing still another difference in ceremony between the two continents: in the Old World infibulation is generally performed between six and eight years of age and defibulation is performed some years later, just before marriage. In the New World both operations are, as it were, telescoped into one.

The appearance of female genital operations in the New World cannot reasonably be ascribed to an Old World origin, since there is no proven historic or prehistoric connection between the Indians of South America and the peoples of Northern and Eastern Africa. If New World manifestations of female genital operations are to be sought in an Old World setting, it should be aboriginal Siberia. Since the mongoloid ancestors of all American Indians probably had to pass through Pleistocene Siberia on the way to the Bering Strait land bridge, the theorist intent on an Old World origin for such customs should investigate the cultures of the historic Siberian tribes for traces of survivals of female genital operations. Alone of all the Siberian peoples, the Itel'mens, formerly known as the Kamchadals, of the Kamchatka Peninsula, Northeast Siberia, are said to have enlarged the labia by manual manipulation, although the evidence for this is far from conclusive (41). It would seem then, that infibulation of females is largely limited to North Africa and that its probable occurrence among the Conibo Indians of Peru is an example of the cultural process known as independent invention.

The geographic distribution of female infibulation (Fig. 31, after Widstrand) is purely Northeast African, with extensions along the Nile Valley and the caravan routes westward to Nigeria (48). Vaginal infibulation occurs among the Somali in Obok, Harrar, Zeila, Bender Djedid, among the Asaorta, a Saho group in Eritrea and among the various Galla groups. It does not occur among the so-called pagan or "true" Galla, but is found among the Danakil. It is known to be present among the Shoa and Galla peoples to the west. However, it is generally absent among the Ethiopian population, although it is said to have existed among the Amhara of that nation in the nineteenth century. Another source (30) claims that in the Sudan, vaginal infibulation exists among the tribal groups known as the Hadendawa

and the Beni Amir. Female infibulation is not only very ancient in the Sudan, but is so deeply entrenched there that in the area of Khartoum an estimated 75 percent of Sudanese women over 20 years of age were still found to be infibulated (44).

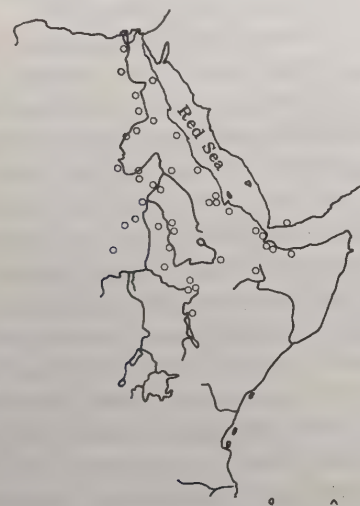


Figure 31. Northeast Africa, showing distribution of female infibulation. (After Widstrand)

Posterior introcision, sometimes called vaginal introcision, is found only in aboriginal Australia. The restricted geographic distribution, its absence among the peoples of Northeast Africa not yet fully Islamicized, its lack of mention in the Koran and its possible existence in Pharaonic Egypt, all point to this operation as one of the most ancient of the several varieties of female genital surgery. With the exception of vaginal introcision in tribal Australia, female surgery is performed by older women of the same tribe. There is a general trend toward the operation itself being done on one girl at a time, instead of in mass ceremonies of rites of passage. Outside the Muslim culture world, specifically in tribal, SubSaharan Africa, clitoral excision occurs during rites of passage. A number of girls are simultaneously declitorised, with elaborate pre-operative and post-operative ceremonies. After removal of the clitoris, the SubSaharan African girl is

physically isolated from her non-excised girl companions. After rejoining the larger tribal community she is then considered to be a woman, eligible for marriage to a circumcised young man of the community.

TABLE VI

GEOGRAPHIC DISTRIBUTION OF FEMALE GENITAL OPERATIONS*

Sunna Circumcision	Infibulation	Clitoridectomy	Types of excision		
			Clitoridectomy and Removal of Labia Minora	Clitoridectomy with Removal of Labia Minora and Labia Majors	Circumbustion
Muslims in Sudan and Somaliland; Muslims in Eritrea and Abyssinia; Mandingos Galla (some) Bantu tribes (some) and some tribes of Sierra Leone, Kenya and Ghana; Muslims in India and Pakistan	Galla (some) Eastern Galla Somali Danakil Asaorta Harrari Hadendawa Beni Amir Shoa (some) Sudan (general) Skopts of Tsarist Russia Ancient Egyptians; pre-Islamic, Ancient Arabs	Gusii Masai Nandi (some) Dorobo Suk Marakwet Elgeyo Taita Samburu Sebei Legenyi Arusha Chagga Gogo Iramba Sukuma Itangi Sambaa	Kikuyu (some) Kemba Somali	Kikuyu (some) Meru Mwimbe Embu Chuka Hehe Baha	Nandi (some)

*Omitting Aboriginal Australia

ORIGINS OF FEMALE GENITAL OPERATIONS

There are no historically new ritual genital operations on either sex. It is impossible to determine which of the existing varieties of genital operations is the oldest or most recent. The few documented instances of female genital ritual surgery in the aboriginal New World appear to be independent inventions. The posterior introcision of the Australian aboriginal appears to be unique to them. It has never been recorded for any other people. My hunch is that this type of female genital operation was invented only once in the cultural history of mankind and was

confined to Australia by the process of geographic and historical isolation. At the time of white colonization of Australia, the aborigines had a material culture and technology roughly comparable to the Upper Paleolithic level of human cultural development in Western Europe and Northern Africa, some 45,000 to 15,000 years ago. Nevertheless, the Australian aboriginal culture was and is characterized by an extremely complex language, social organization and by an elaborate set of puberty rites. There were genital operations for both sexes, although such rituals varied from region to region and were not uniformly present among all aboriginal subgroups.

Did genital operations on either sex originate during the Upper Paleolithic and cave-dwelling era of human culture history in the Old World? No one knows, of course. The cave art of the Cro-Magnon inhabitants of Paleolithic France and Spain shows no evidence of genital mutilations. Their obsidian blades and finely chiselled cutting implements were sufficiently sophisticated to perform genital surgery equal in complexity to that practiced by the Australian aborigines. The hunting economy of the Upper Paleolithic in Eurasia was based on the presence of big game animals and these gradually disappeared and some shifted their grazing sites northward towards the end of the last glacial period. Man became a gatherer of food and a coastal fisherman to supplant his diminishing reliance on game; this period of cultural development is called Mesolithic. It is devoid of the great cave art of the Old Stone Age and hence offers no evidence for the invention or practice of genital operations. The Neolithic, literally New Stone Age, followed in the Middle East and was characterized by the domestication of draft animals, the invention of agriculture, pottery and the beginnings of sedentary, village life. The existence of genital surgery accompanied by rituals can neither be proven nor disproven for this period of prehistory.

Prehistory offers no archeological clues for the origins of genital operations. Around the eastern shores of the Mediterranean a number of urban civilizations arose, hieroglyphic and cuneiform writing systems emerged, social stratification became entrenched and bronze alloys and sophisticated political and mili-

tary systems came into being. My own view is that in one of these emergent Near Eastern or Middle Eastern cultures the customs of ritual genital operations arose, independent of such practices in both the New World and in the Paleolithic technological culture of the Australian aboriginal. One of the most persistent theories for the origin of ritual genital operations is that such customs began in Pharaonic Egypt. A medical observer (30) of female genital surgery in the Sudan relates the local folkloristic account that the custom started when an unnamed Pharaoh was afflicted from birth with a miniature penis. Because of this, he was unable to enjoy the erotic favors of his female subjects to the fullest extent. He finally issued a proclamation that all females would be circumcised in such a way as to narrow the vaginal orifice. Thereafter he was able to savor the sexual delights of his infibulated female subjects. Jisr speculated that perhaps through the influence of slaves, the custom of vaginal infibulation was introduced from Ancient Egypt into the Sudan, where it prevails today.

Herodotus asserted that the Egyptians were taught the practice of female circumcision by some ancient but unspecified Semitic people. In any event, the archeological evidence of murals depicting male circumcision in Pharaonic Egypt is fairly solid. The oldest pictorial representation of male circumcision discovered thus far comes from the private tomb of Ankmahor at Saqqara, in the mysterious "Plain of Mummies." A relief depicts a priest-doctor of the Sixth Dynasty (circa 2400 B.C.) in the act of circumcising a boy. The text of Teti, which also belongs to the same dynasty, makes mention of a god of circumcision. A number of mummies show that the practice was common, though not universal, throughout Egyptian history (5). According to Strabo's Geography, Pharaonic Egypt was characterised by both male circumcision and clitoral excision, interpreted to mean in the case of a girl, the cutting off of sections of the clitoris and the labia minora. Most royal female mummies' states of preservation do not permit firm conclusions about the existence of Pharaonic circumcision and vaginal infibulation (5). My own belief is that such customs did exist in Pharaonic Egypt but that proof or disproof of this assumption must await even further archeological exploration.

In Ancient Egypt, female genital surgery seems to have taken place between the ages of 14 and 15 years. It seems probable that even the amorous adventures of Cleopatra may have been conducted sans clitoris. One account (44) suggests that genital surgery on Ancient Egyptian young ladies was limited to rulers, priests and their respective families. Women from these social and occupational classes may not have been able to inherit property unless they had first undergone some form of genital surgery (44). Shandall states that a large number of Pharaonically circumcised mummies have been discovered, but only relatively few were vaginally infibulated. He indicates, as Jisr had done earlier, that perhaps these Ancient Egyptian forms of female genital operations diffused into the north of the Sudan. He also feels that female genital operations probably existed among the Ancient Arabs, long before the advent of Muhammed the Prophet. Among the pre-Islamic Arabic peoples such customs may have served the function of allegedly protecting shepherd girls against sexual assaults, if the girls were otherwise unescorted by males from their own group.

In the contemporary Sudan, Sunna circumcision of the female is not an ordinance of Islam. The survival of the perhaps older forms of female genital surgery in less Islamicized, less Arabized parts of the Middle East is not unexpected. The Near East-Middle East is an ancient mosaic of diverse cultures and the cultural survival of ritual genital operations of possible Pharaonic Egyptian origin would not be surprising.

One anonymous scholar provides this graphic portrait of daily life in Pharaonic Egypt, citing the fifteenth of the British Papyri (2). In this document, Armai, an Egyptian living within the sacred precincts of the Serapeum of Memphis, presented the following petition to the Stratagen, or high priest:

Tatemi, the daughter of Memphis, residing with him in the Serapeum, has already amassed by her collections and by the free gifts of visitors, a certain fortune, amounting to 1 talent and 390 drachmas, which she had deposited in his hands for safe-keeping. Thereupon was he deceived in the following manner by Tatemi's mother. She pretended to him that her daughter had attained the age, when according to Egyptian custom, she should be circum-

cised. Therefore, he should pay the sum into her hands, so that on the occasion of this solemn celebration she might be able to properly dress and endow her daughter. If it should not come to pass that this intention be not fulfilled, of the circumcision of her daughter Tatemi in the month of Machis of the year XVIII, she would refund him the sum of 2,400 drachmas. He had accepted this proposal and had handed to Nefori the said sum of 1 talent and 390 drachmas. But the daughter reproaches him, claiming her money back. Important business had prevented him from going himself to Memphis, to there attend to this matter. Therefore, he does pray that Nefori be cited before the tribunal, and made the subject of a judicial decision.

The anonymous author of *Praeputii Incisio* felt that Ancient Egyptians performed circumcision only on boys of the sacerdotal or warrior class, but that they submitted all girls without distinction to some kind of genital surgery. As he interpreted the ancient writings, Pharaonic Egyptian girls obtained their dowries, thus in a certain way earning their marriage portions. Herodotus, however, reasoned that since no woman in Ancient Egypt was allowed to exercise any priestly function, female genital operations could not bring them any priestly advantages. An unspecified Egyptian document dated to 163 B.C. is cited by Montagu (37) to mean that clitoral excision was practiced on all girls. I suggest that the evidence for such a sweeping assumption is lacking. Among contemporary peoples who practice reduction or complete declitorization, all girls are subjected to the operation in rites of passage. By implication, Montagu is claiming that Pharaonic Egypt practiced rites of passage for all Egyptian girls without exception and that the operation consisted of some form of clitoral excision. This hypothesis remains unproven. Montagu also notes that early medical writers have described the excision of the clitoris or nymphae when they were observed to be hypertrophied, or else when erection of the clitoris became objectionable. Ghalioungi (24) alludes to the translation of one Egyptian monument indicating that a boy had been circumcised as part of a group of 120 boys his own age. While the evidence is slim, the possibility exists that something resembling rites of passage and involving male circumcision did exist in the culture of Pharaonic Egypt.

The exclusive evidence of genital surgery, with or without public ceremonies, in the culture of Pharaonic Egypt has been given many different and contradictory interpretations. My own view is that some kind of vaginal infibulation and Pharaonic circumcision apparently did exist in Ancient Egypt, although mural and other pictorial evidence for this operation does not yet exist. Some kind of declitorisation apparently also existed, although I am not convinced that rites of passage specified that all Egyptian girls, regardless of social class, had to undergo this or any other genital operation. Were these genital operations limited only to upper class girls in Ancient Egypt or did they affect all classes of Ancient Egyptian society, including the captured slaves? Until archeologists uncover additional evidence, we can only speculate.

DECLITORIZATION IN WESTERN MEDICAL SCIENCE

American school children spend many hours learning of that famous discovery by Christopher Columbus. As sex education slowly spreads throughout the United States, they may have an opportunity to learn of still another Columbus, who claimed an equally significant discovery. One Realdus Columbus of Cremona in 1593 ascribed to himself the honor of discovering the clitoris. He even took it upon himself to suggest a name for the structure, which he believed had not been observed by anyone before him (32). Had this Renaissance scholar been as familiar with Latin as some of his medical and literary contemporaries, he would have discovered that at least fifteen terms existed in that language for the clitoris. Moreover, at least one of these terms was a reference to the erectile qualities of this tiny organ.

Folk anatomical knowledge of the engorgement of the clitoris among the English is graphically illustrated by the term "cunt stand" from 18th century written usage, probably orally transmitted from an even earlier period (11). One quality of the clitoris which very early attracted the attention of both popular and medical observers was its occasional hypertrophy. This was especially true if the hypertrophy were pronounced, or occurred

in combination with still another anatomical anomalies. Dr. George G. Sigmond noted that in the year 1777 Marie Lange, described as an hermaphrodite with a clitoris seven inches long, was on exhibition in London and Paris. It was not revealed whether surgery was attempted to reduce the size of her clitoris. Still another early medical note on hypertrophy of the clitoris was the account given of one Marie Lefort in England in 1815, but the dimensions of her organ were not given. These authors did not say whether excision of the clitoris was done. However, by the beginning of the 19th century, excision of the clitoris for a variety of medical rationales, was becoming more prevalent, and individual case histories concerning the pathology and surgical removal or reduction of this organ were described in the medical literature.*

About the same time that European travellers were learning of the existence of clitoral excision among the peoples of Africa, this procedure appeared in English and continental journals. The European and English use of declitorization is generally ignored in anthropological writings. This is because anthropologists have concentrated on tribal societies, paying only slight heed to the culture history of Western civilization. In *The Lancet* in 1825 a description was given of an operation performed in Berlin on June 20, 1822, by a Dr. Graefe. The allegedly idiotic fourteen-year-old patient had a medical history which included both excessive masturbation and nymphomania. The operation was credited with some interesting postoperative effects:

After the cicatrization of the wound, a marked amelioration of the symptoms was observed. The propensity to self-pollution was nearly eradicated; a few suspicious motions, the remains of a long-continued habit, were occasionally observed, but they were at length discontinued. The intellectual faculties of the patient began to develop themselves, and her education could now be commenced. She can, at this time, talk, read, reckon, execute several

*Repugnance toward clitoral hypertrophy was not limited to Western civilization. While this attitude is by no means universal, the clitoris-excising peoples of tribal, SubSaharan Africa view the retention of a large clitoris with disgust. By contrast, in Polynesia and Micronesia, a large clitoris is highly esteemed and viewed as aesthetically and sexually desirable.

kinds of needle-work, and a few easy pieces on the piano forte. It is a remarkable circumstance that this young girl, on emerging from moral lethargy in which she had sunk from infancy, assumed at once, without any intervening gradations, the character and tastes of adolescence.

The first four decades of *The Lancet* abound in case histories of patients declitorized for a variety of medical reasons. Thus one patient who was excised on September 9, 1837, had hypertrophy of both the clitoris and nymphae and a history of gonorrhea prior to hospitalization. It was claimed that a complete cure was effected after excision of the clitoris and removal of a tumour, the precise location of which was not given. In the pre-psychiatric era of nineteenth century Western medical history, a variety of medical rationales were given for excision of the clitoris. Among the most common cited for declitorization were hypertrophy of that organ, any kind of malignant growth on or near the clitoris and infantile, adolescent or adult masturbation regarded as excessive.

A kind of occupational folklore about the clitoris and the alleged benefits of declitorization developed within the medical profession in the first six decades of the nineteenth century. For some authors, the seat of nymphomania had a definite physiological locus; some saw it in the cerebellum, others in the uterus, some in the ovaries and some, finally, in the clitoris. In the early 1800s this led to a wave of excisions in Germany, France and England. At the height of Victorian prudery there was a great preoccupation with the effects of masturbation upon the young of both sexes, a concern shared by the medical profession. Excision as a cure for masturbation was noted in Paris as early as 1812 (46). Dr. Tanner offers fascinating insight into the surgical practices and behavioral assumptions of that era:

A young woman was so addicted to masturbation that she became reduced to the last stage of marasmus. Sensible of the danger of her situation, yet not possessed of sufficient fortitude, or else irresistibly impelled by the pleasurable sensations which resulted, she could not command herself. If her hands were tied, she resorted to friction against the edge of the bed. If her legs were fastened, she managed, by moving her thighs, to provoke abundant

pollutions. Her parents took her to Professor Dubois. Following the example of Levret, he proposed amputation of the clitoris, which the patient and her parents agreed to. The organ was removed with one stroke of a bistoury, and the bleeding was prevented by an application of the actual cautery. The operation quickly succeeded, and the patient was cured of her fatal habit. She quickly recovered her health and strength.

The practice of declitorization reached its highest incidence and greatest popularity in England during the 1860s; its most ardent advocate was an English surgeon, Isaac Baker Brown. His wholesale application of clitoridectomy to almost every conceivable kind of female pathology eventually resulted in his expulsion from the Obstetrical Society of London. Dr. Tanner, as early as 1866, was one of the most severe critics of panacea clitoridectomy, even expressing doubt about the alleged medical benefits of male circumcision (46). Citing a large number of case histories of his own private patients, Tanner questioned the claims of the clitoris removers. A heated controversy over the merits and disadvantages of clitoridectomy filled the pages of *The Lancet* in 1866 and 1867. The majority of surgeons writing in *The Lancet* saw less merit in clitoridectomy than did Brown. Writing some time after the death of Brown, Tait (45) wrote:

Some thirty years ago, there lived and flourished in London, a surgeon of great ability, Mr. Baker Brown, whose influence in the history of ovariectomy will be displayed in its appropriate place. Mr. Baker Brown was not a very accurate observer, nor a logical reasoner. He found that a number of semidemented epileptics were habitual masturbators, and the masturbation was, in women, chiefly effected by excitement of the mucous membrane on and around the clitoris. Jumping over two grave omissions in the syllogism, and putting the cart before the horse, he arrived at the conclusion that removal of the clitoris would stop the pernicious habit, and therefore cure the epilepsy. He operated on an enormous number of cases, for epilepsy is very common, and patients will submit to almost anything which promises a hope of relief. There can be no doubt that many cases were temporarily benefitted, just as cases of epilepsy are benefitted for a while by castration (in the male), removal of the uterine appendages (in women), and trephining (in both sexes). Besides Mr. Baker Brown's operations had no mortality, and the reduction of the sexual distemper

of a number of epileptics even for a while, or to some extent, was of itself a benefit. But Mr. Brown carried his efforts to a most injudicious extent, due to the fact he was suffering from very extensive cerebral softening, and was really incapable of forming a sound judgment.

Tait felt that the decision of the Obstetrical Society to expel Brown was disastrous, since it led to discarding clitoridectomy altogether, which procedure Tait felt still had some merit in cases where the patient had a "depraved sexual appetite." The association between "excessive" masturbation and clitoridectomy continued for some decades after Dr. Brown's fall from grace (21). Eyer, a Cleveland, Ohio, surgeon, also felt that Brown's colleagues had overreacted, and he described the excision of the clitoris from one of his own patients, whose masturbation was said to be of the clitoral type. Eyer reported that within eighteen months the patient was improved in health, with only one admitted instance of masturbation.

By the advent of the twentieth century clitoridectomy as a cure for masturbation had almost disappeared, as medical views on masturbation changed (18). Duffy has shown how, in the later years of the nineteenth century, doctors and laity alike agreed that masturbation was a physical as well as a spiritual evil, and that its practice was fraught with the direst of moral consequences. Anthropologists may have blind spots also, as Ford has shown (22). Many ethnographic accounts of preliterate people utterly fail to uncover attitudes towards masturbation, the relative prevalence or absence, and differences in practices between boys and girls. Ford did generalize however, that among most preliterate peoples, masturbation in children is more or less tolerated, while the masturbation of adults, especially in public, is rarely condoned.

As far as I can tell from the ethnological reports on the various people who surgically alter female genitalia, including the clitoris, no people outside Western civilization has ever employed excision of the clitoris as a supposed cure for female masturbation.

It is by no means clear when medical writers stopped making value judgments as to the allegedly prenicious nature of mastur-

bation. In 1907 a Louisiana physician (28) still referred to this behavior among both sexes as "the inevitable vice" and he was able to trace the folkloristic belief that masturbation can lead to insanity to eighteenth century medical writings. It was probably unavoidable that physicians and surgeons, responding to such a cultural climate of popular opinion in the nineteenth century, should seize upon clitoridectomy as a means of restraining or abolishing the solitary vice.*

FEMALE CIRCUMCISION IN WESTERN MEDICAL SCIENCE

Female circumcision is the separation of the prepuce and glans clitoridis, and the removal of the prepuce. I have already indicated the nineteenth century interest in excision due to concern with masturbation. Although reaction within the medical profession to the widespread use of clitoridectomy as a remedy for female masturbation was largely responsible for the decline of that surgical procedure in the final three decades of that century, the medical profession by no means lost interest in surgical treatment for female masturbation and nymphomania. Doctors reflected their cultural climate and euphemisms were very much the order of the day. Tanner (46) writing of female masturbation simply referred to "unhealthy practices." A generation later, Tait (45) warned against overrating the evil effects of masturbation, but advocated clitoridectomy in "selected cases." He did not, however, specifically recommend the use of female circumcision, as did his contemporary, Morriss (38).

Dr. Morriss not only believed that adhesions between the glans and prepuce of the clitoris were most common as a racial trait of whites, but he also showed convincing (to him) clinical evidence from his private practice that preputial adhesions and other irritations of the clitoris had produced a variety of medical problems; he cited instances from his own practice of seeming cures effected through circumcision. It is to his credit that he

*Let us hope that the profession of medicine continues its current benevolent attitude toward the clitoris and its usefulness.

was one of the first physicians to try to prove a causal relationship between clitoral adhesions and a tendency towards masturbation, by the collection of evidence rather than opinion. He kept careful clinical records on the postoperative effects of this operation and he offered scientific evidence that preputial adhesions, if uncorrected surgically, could result in severe complications in women or older girls. He claimed to have cured a patient who had been a nymphomaniac for more than eight years, noting that her prepuce was firmly adhered to the glans clitoridis. Some limited support for female circumcision for clitoral adhesions exists to the present day.

Not long after the observations of Morriss, a study of masturbation in fifty-two female infants (23) showed marked clitoral adhesions, with the clitoris frequently buried in these adhesions. It was suggested that in the nervous, sensitive child irritation from clitoral adhesions could result in infantile masturbation and thence to "moral depravity," left undefined. Freeman recommended that in general more attention should be paid by the medical profession to the condition of the clitoris in all young girls with symptoms of nervous irritability. Following Morriss, he maintained that female circumcision in such cases produced satisfactory results, often with the pre-existing habit of masturbation disappearing completely. A bit later a woman physician from Texas (20) reported her examinations of more than two hundred and fifty girls, noting that less than a dozen of her charges were without anomalies of the clitoris, usually adhesions. She defined a normal or non-pathological clitoris as one with a prepuce short enough to expose the glans, with no smegma in evidence, and with a glans free from adhesions when stretched laterally. If only five percent of girls were "normal," the meaning of normal might be questioned. She found only a single occurrence of an "hypertrophied" clitoris. Eskridge strongly disagreed with previous writers who had insisted that clitoral hypertrophy was due to excessive masturbation. Her concept of prepubertal masturbation was that it was due to external irritation, or to outside influences rather than to an internal emotion. She concluded that circumcision of girls relieves one of the greatest causes of masturbation, going further in her enthusiasm for the

hygienic benefits of circumcision for girls than any writer before her. The neutral, clinically descriptive terms with which Eskridge treats the subject of female masturbation is a contrast with the medical writers who used such value-laden terms as "moral depravity," "solitary vice" or "moral leprosy" when referring to female autoerotic behavior. Although individual physicians like Eskridge resorted to widespread, and apparently quite successful, use of female circumcision, this surgical procedure never became as prevalent as had clitoridectomy in the first half of the previous century.

My interpretation is that the procedure of female circumcision quietly gained limited adherents, devoid of the notoriety of excesses of nineteenth century declitorizing, and that the sexual ethos of Western civilization, by Eskridge's time, had begun to turn away from Victorian morality, a fact now being reflected in the kind of language employed in medical writings. Eighteen years after the publication of Eskridge's study, a Houston, Texas, gynecologist remarked that many doctors seemed to be unaware of the existence of female circumcision and therefore did not know the clinical indications for the operation, nor the results that might be expected (29). Iams pointed out the continuous line of medical evidence from Freeman, Eskridge and others in which there was agreement that an adherent prepuce in the clitoris was one of the greatest causes for producing local irritation and inflammation. He also indicated that it had been clinically determined by these and other researchers that the diseases caused by pathological foreskin in the male may be duplicated in the anatomically homologous clitoris, in addition to diseases peculiar to females. Iams also brought out that the proponents of female circumcision, i.e., Eskridge, Dawson, Davis and by implication himself as well, concurred that in the sexual glands of females such irritations may affect the mental and moral faculties, causing sexual "perversion" as well as neuroses and psychoses. The entire group of investigators seems in agreement that an adherent prepuce in prepubertal girls could also lead to masturbation. As recently as 1963 it was reported (12) that in a series of one hundred consecutive cases of vulvovaginal examinations, ninety-two patients had adhesions between pre-

puce and clitoris, and that in seventy-five they were definitely great enough to interfere with normal sexual sensation. A case history of a five-year-old was given in which the child was said to be a compulsive masturbator, a nightly bedwetter and upon examination, was found to have an almost completely hooded clitoris. After circumcision removed the adhesions, the masturbation and other symptoms were observed to have diminished. Clark also indicated the marital difficulties of several women whose clitoral adhesions caused them to avoid coitus as difficult and painful. Further,

When a girl reaches puberty and menstruation makes its appearance, wearing a menstrual pad may cause enough pressure upon the sensitive clitoris with the adherent prepuce and trapped granules to produce excessive discomfort. When this is the case, menstruation is a period of four or five days of real discomfort. A few years later, at age 15 to 18, another factor enters into the situation. The girl becomes aware of young males and conscious of the fact that it is pleasant to have one take an interest in her. But some girls find this a physically disturbing experience. In a very vague sort of way they are uncomfortable in an area about which questions are taboo. They don't know what to do. Covered with guilt over the fact that this discomfort centers in what they know is the sexual area, the only solution they can find is to keep boys out of reach and out of mind. Some of our most seriously disturbed young women probably have the genesis of their troubles in this relationship of adhesions between prepuce and clitoris.

COMPLICATIONS FROM FEMALE GENITAL OPERATIONS

Damage and complications from the diverse kinds of female genital operations vary greatly, inasmuch as the extent of surgery ranges from minimal, in the case of Sunna circumcision, to extensive in Pharaonic circumcision and infibulation. The skill, inexperience or carelessness of the midwife is another variable. Thus, among the Kikuyu of Kenya, who usually practice only excision, instances of unintentional infibulation, caused by a careless midwife, have been reported (34). If carefully performed under aseptic conditions, Sunna circumcision probably involves the least hazard to the health of the patient.

By far the most comprehensive study of the complications from different kinds of female genital operations is that of Dr. Shandall of the Faculty of Medicine, Khartoum, Sudan (44). He examined 4,024 females, of whom 3,280 were circumcised in various ways and 204 were not. He divided the circumcised group into two further subdivisions: Group A, consisting of 3,013 Pharaonically circumcised women, or what he calls Type 3 circumcision, and Group B, 807 women who were Sunna circumcised, his Type 1 circumcision. All uncircumcised women were grouped into Group C. Additionally 200 prostitutes, not included in the study group, were examined to find the distribution of the various types of circumcision among them. Three hundred husbands were interviewed as to their opinions on female genital operations, and information about the sexual behavior of their wives was elicited.

Immediate complications described among Group A included shock, haemorrhage, retention of urine, injury to adjacent structures, and failure of the vulval wounds to heal. These complications have also been reported for such SubSaharan, non-Islamic tribal groups as the Kikuyu and Ameru, who normally practice clitoral excision rather than infibulation and Pharaonic circumcision. When Shandall compared his Group A patient sample with 807 who had been circumcised in the milder, Sunna fashion he found that complications were nearly six times more common from the more drastic operation.

About 1950, local analgesia was introduced to at least some Sudanese midwives and Shandall feels that because of this the incidence of complications from these operations is now declining. Retention of urine was found in more than 10 percent of the Pharaonically circumcised group. By contrast, this condition was found in only 1 percent of the girls who had been circumcised in the Sunna manner. Failure to heal due to infection was about seven times higher for the Pharaonically circumcised patients than for the Sunna sample. For the former group, keloid scar formation was estimated to be ten times commoner than in the latter group. Vulval cysts and abscesses were found in 51 of the Pharaonic group, but in only 2 of the Sunna group. Among the Pharaonically circumcised, urinary infection was discovered

in 28 percent, while among the Sunna sample, it was found in only 8 percent. Shandall's indications for Sunna circumcision include phimosis, the formation of smegmaliths on the clitoris (especially if probing fails to clear the smegma), labial hypertrophy and a redundancy of the prepuce. He states that untreated phimosis can prevent adult women from achieving orgasm during coitus.

Only two kinds of genital operations were, of necessity, omitted from this pioneering study done in Khartoum, namely the excision typical of SubSaharan, tribal East Africa, and, of course, the posterior introcision found exclusively among the Australian aborigines. (I know of no comparable study of the complications of posterior introcision among the Australian aborigines, but there is some scattered date on complications said to result from excision, or clitoridectomy.) Shandall's humanitarianism is in the finest tradition of the healing arts, for he proposes needed reforms, which can be carried out within the structure of the culture which produced these problems.



Figure 32. Reinfibulation following third delivery. Remaining introitus is only 4 mm, but can be stretched enough for conception. Original infibulation removed clitoris and labia minora. (Photo courtesy Dr. A. F. Shandall.)

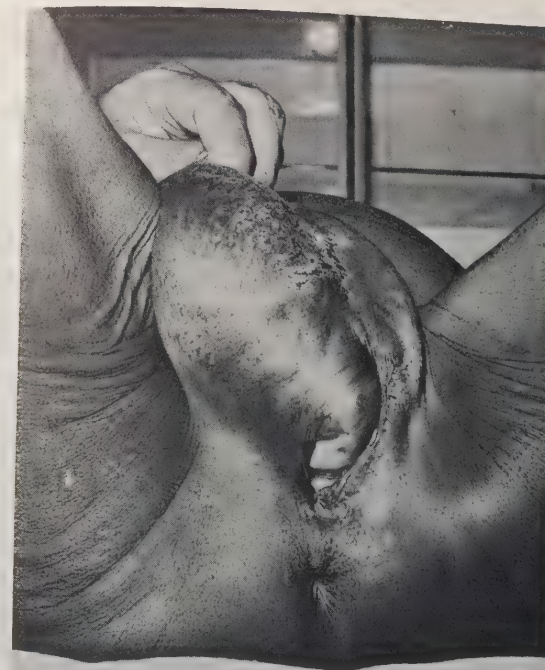


Figure 33. Large inclusion cyst in infibulation scar, later removed surgically. (Photo courtesy Dr. A. F. Shandall.)

Among the Kikuyu of Kenya the operation differs slightly from district to district, consisting in some areas of excision of the clitoris only, in others excision of this organ plus cuts on the upper parts of the labia majora. In most cases (34) the wound healed quickly, but in each district there were always a few cases of subsequent septic poisoning. This meant that the wound took a very long time to heal, and that when it did eventually, a large scar tissue was left. Such scars made childbirth difficult, and sometimes fatal.

A more detailed study of complications among the Kikuyu (25) cites the usual aftercare afforded the girls. The patient is led, or carried away, attended by sponsors or female relatives, who act as nurses. The wounds are washed and dressed daily and the sponsor sees to it that the opposing surfaces do not unite,

inserting a bunch of leaves to prevent this from happening. Sometimes the sponsors fail, the surfaces unite, and there are varying degrees of atresia, up to complete closure. Dense bands of fibrous tissue form, enough to seriously interfere with labor in at least 10 percent of the cases Gillan saw. At least one Kikuyu girl was circumcised forcibly; the wound became septic and the girl suffered greatly. Gillan reported many common complications from excision among the Kikuyu. There is often painful urination (dysuria), since the vagina forms a secondary reservoir for urine which drains through what opening it can find. In one instance, a calculus was found to fill the vagina. Haematocolpos, an accumulation of blood in the vagina, was said to be a cause of sterility and painful menses. In one case, the cervix was shut off completely from the vagina by a dense membrane. Painful coitus (dyspareunia) was the most frequent result from excision; Gillan noted that 50 such cases was the annual average at a single field hospital in Kenya. He found it surprising how many years of married life might elapse before relief was finally sought. Difficult labor was the most serious complication, with most of the mothers stenosed to some degree, which interfered with normal elasticity.

In 1942, another investigator (3) offered an even more pessimistic view of complications among the Kikuyu resulting from clitoridectomy. He found bleeding is often profuse at the time of excision, occasionally leading to death; inflammation was always present, with extensive scarring of the parts affected. Afterwards, menstruation is difficult and coition sometimes impossible, all of which reaffirm earlier reports. Prevention of coitus due to the operation occurred frequently enough among the Kikuyu that they have a special word for it, "nduri." Arthur also concurred with Gillan's account of great difficulties in childbirth, with mother and infant sometimes dying. Brassington, another Kenyan observer (9) saw among his patients of the Ameru tribe, that careless operators, intent on excision only, sometimes cut into the vagina, causing both dysuria and the growth of a circular band of dense, fibrous tissue where the labia minora were accidentally sheared away. In both cases labor was rendered more difficult.

Arthritis may be the most unusual complication of female genital operation (27). Five Kikuyu girls, aged 10-11 years, who had undergone excision shortly before admission to the Fort Hall Hospital in 1958, were found to have inflammatory lesions in or near one or more joints. In each case the incision for removal of the clitoris was a vertical scar about one inch in length. Although the scars had healed well and the inguinal glands were not enlarged, all patients developed symptoms which included fevers, pain and swelling of the joints; the symptoms appeared 13-21 days after excision. Hall interpreted the illnesses as an epidemic illness due to a micro-organism probably introduced at the site of a surgical wound.

What of the mental damage from all this cutting, scarring and pain-inflicting? Marie Bonaparte (8), one of Freud's early pupils, remarked that mutilations are frequently described and rarely explained. This seems very true. Further, I agree with her comment that those who have investigated such operations seem to have neglected their effects on female psychosexuality. She described several women excised for a variety of reasons. Case 1, a German woman, was said to have been totally frigid during coitus, but remained a compulsive masturbator. She not only had undergone excision of the clitoris, but also ablation of both Fallopian tubes and ovaries. Surgery failed to relieve this woman's symptoms. Bonaparte examined the patient and felt that the erotogenic zone was located precisely on the scar of the glans clitoridis. Case 2, an African woman of 40 and the mother of two, had been clitorally excised when she was only 6 years old, as had all her sisters, recalling the operation as very painful. (Unfortunately, Bonaparte did not give ethnographic details on her non-European cases of excision.) This woman was also said to have been a childhood masturbator, and had the ability to achieve orgasm even after excision. Case 3, a Mrs. B., also African, suffered hemorrhage, fever and infection from a careless excision which had caused extensive damage to the labia minora. She had not been known to have previously masturbated. The genital mutilation was recalled vividly and with great bitterness. After marriage the patient was reported able to achieve orgasm, albeit very slowly, about one time in every three acts of coitus.

Her erotogenic zone was described as being still located over the clitoridal scar. Disagreeing with Freud, Bonaparte concluded that the mere ablation of the clitoris was insufficient to "internalize" the sexuality of women, that is, to reorient their sexuality away from the clitoris towards the vagina.

Shandall points out that psychological trauma, while extremely variable, is sometimes very severe, despite the cultural conditioning which should ideally cause the girl to look forward to her circumcision (*tahour*) as a day of pleasure and celebration. After the new clothes and presents, the severe pain is a rude surprise, although in the Sudan at least, the girl knows that some pain is to be expected and that she will be confined in bed in her house for two weeks or more following Pharaonic circumcision. Shandall found that 80 percent of the women Pharaonically mutilated had never had orgasm, as compared with 12 percent in the Sunna circumcised group.

However, the psychosexual ethos of the Arab/Muslim culture world may be in the process of change. Thus, he reports that the older husbands may have enjoyed the presence of Pharaonic circumcision, but that the younger generation of Sudanese husbands prefer a wife who shares more things with them, including presumably, the ability to reach orgasm. The more educated young men have recently tended to marry European girls, Arab girls from countries practicing neither Pharaonic circumcision nor vaginal infibulation, or wives of pure Arabic origin, whose religious beliefs have saved them from the more drastic forms of genital mutilation.

CULTURAL CONTEXTS AND CLITORAL MANIPULATIONS

Ownership of a clitoris is not unique to the erect, featherless bipeds who read these pages. This organ is found among the tailless great apes, the gorilla, the chimpanzee, the orang-utan and the gibbon, as well as among the tailed monkeys of the Old World and New World. What is unique to mankind is culture, which consists of shared, symbolic patterns of behavior that are learned and not instinctive. Culture includes the structured ways

of acting that are found in a group of people sharing a common historical tradition.

Much of anthropological theory concerns the differences and similarities among the various cultures of mankind. The ethnographer studies a particular culture, or several cultures, and attempts to describe and reconstruct the aggregation of discrete elements observed. He is not only concerned with the enumeration of separate culture traits, but how these elements are organized and work in a functioning, whole system. Ultimately, each culture is unique in its contents, structure and particular combination of ideas. At the same time, however, all cultures share categories of cultural behavior, known as crosscultural similarities or common denominators of culture; they are known to occur in every preliterate and historic culture known to ethnography and history. George P. Murdock (39) offers a partial list of such items, arranged in alphabetical order to underscore their variety:

Age-grading, athletic sports, bodily adornment, calendar, cleanliness training, community organization, cooking, cooperative labor, cosmology, courtship, dancing, decorative art, divination, division of labor, dream interpretation, education, eschatology, ethics, ethnobotany, etiquette, faith healing, feasting, family, fire making, folklore, foot taboos, funeral rites, games, gestures, gift giving, government, greetings, hair styles, hospitality, housing, hygiene, incest taboos, inheritance rules, joking, kin-groups, kinship nomenclature, language, law, luck superstition, magic, marriage, mealtimes, medicine, modesty, mourning, law, music, mythology, numerals, obstetrics, penal sanctions, personal names, population policy, postnatal care, pregnancy usages, property rights, propitiation of supernatural beings, puberty customs, religious ritual, residence rules, sexual restrictions, soul concepts, status differentiation, surgery, tool making, trade, visiting, weaning, and weather control.

Before looking at some probable crosscultural similarities in female genital operations, it is necessary to discuss age-grades and the difference between biological and sociological puberty. All cultures recognize different behavioral expectations for infants, young adults and old people. In this minimal sense, age-grades are universal, although the contents of culture vary

enormously; some societies recognize additional age-grades, with specific modes of promoting the youngest members to the next older age-grade, whatever that may be.

Adult social status is not always conferred at the onset of physiological puberty for either boys or girls. Biological puberty in girls is marked by development of the breasts and mons veneris, the growth of pubic hair and menarche. The age of first menstruation varies greatly among the different racial and ethnic groups of the world. It is true that sometimes physiological puberty is the culturally determined time for "puberty customs," but this is rare. One of the pioneering students of the crosscultural rites associated with age-grading has rejected the concept of "puberty rites" as inaccurate for this reason (47). Van Gennep preferred to call such collective ceremonies and rituals *rites de passage*, a special type of rite of initiation. He supported the idea that most rites of passage are sexual in nature and cited convincing evidence that promotion of the child to the next higher age-grade often signified a change from the more asexual world of the child to the sexual privileges allowed adult members of that society.

In tribal Africa south of the Sahara, excision of the clitoris occurs within a specific psychosexual cultural context. The elements of culture included in this complex consist of age-grading, mass ceremonies marked by special dress for the young initiates, ritual ornamentation for both sexes, music and dancing, varying periods of seclusion separating the initiates from their former age-mates, and special training in sexual matters before resuming communal living within the tribe. In general, it is possible to say that clitoral excision and male circumcision in this part of non-Muslim Africa take place at the age of physiological puberty, or shortly thereafter. As will be seen from Table VII, the age at which genital operations take place is quite variable.

It is readily apparent that there is no necessary relationship between the customary age at which various cultures dictate genital operations and the onset of physiological puberty. To put it another way, not all rites of passage occur at physiological puberty. What Murdock deems "puberty customs" are crosscultural, but they most often do not include genital operations of

TABLE VII

AGE OF GIRLS AT TIME OF GENITAL SURGERY (after Shandall)

Age	Country, Area or People
8 days	Abyssinia
Few weeks	Ancient Arabia
3-6 years	Somaliland (Types I and II)
7-10 years	Somaliland (Type III)
5-10 years	Sudan
6-10 years	Egypt (before prohibition)
12-13 years	Most other African countries
14-15 years	Introcision in Australia
14-15 years	Bantu tribes of Africa (Types II and III)
14-15 years	Ancient Egyptians (Types II and III)
15 years plus	Masai (shortly after marriage)
	Swahili and Guinea (infibulate after childbirth)

any kind, either male or female. As I have pointed out for tribal East Africa, however, this culture area is characterized by elaborate ceremonies marking the transition of the girl from childhood to adult status in her tribe, and clitoral excision is an integral part of this cultural complex. A very small number of aboriginal tribes in South America constitute the only New World examples of female genital surgery within rites of passage; the remainder of associations of female genital operations with rites of passage occur in the non-Muslim cultural areas of Africa, south of the Sahara, with the exception of the association of genital surgery and Australian aboriginal rites of passage. Vaginal infibulation tends to take place on one girl at a time, is usually performed by an older woman of the tribe, and is not characterized by the presence of elaborate social rituals. The chronological age at which female genital surgery takes place reveals little about the intent of the operation, however.

All known cultures include one crosscultural category of behavior and ideals not mentioned by Murdock. I call this the psychosexual ethos, defined as the culturally inherited and socially shared set of modesty beliefs, attitudes toward masturbation in the young and old alike, adultery and premarital virginity attitudes, sanctions imposed against violators of such behavior, and the sexual training of the prepubescent and postpubescent young. It also involves a sexual aesthetic as to what constitutes male and female ideal beauty, which may or may not include definite ideas about the appearance of the female pudenda, including or excluding the clitoris. Few peoples of the world have failed to react to an hypertrophied clitoris, although here too the responses seem determined by the lens of culture. Ethnographic observation among the Nandi of East Africa gives an example (10):

The reason given me repeatedly, for the circumcision of girls among the Nandi, was that the children of the uncircumcised would die. But this is an inference drawn from the existing inhuman custom of strangling the children of uncircumcised girls. So this is no explanation at all. In answer to my question on the circumcision of girls a village chieftain said to me, "We are Nandi, we don't want anything like that in front of our women!" And he made a disdainful gesture with his little finger, as if he meant to signify the clitoris.

The Nandi, who practice not only excision of the clitoris by knife or razor blade, but also male circumcision, are unique in their use of circumbustion of the clitoris and the male prepuce during rites of passage. It can be seen even from the brief account by Bryk that a number of rationales exist among the Nandi for clitoral excision, only one of which is the alleged aesthetic repugnance of this organ to male eyes. The deviant, or non-excised Nandi girl probably would not be able to find a husband.

Bryk's massive study of the Nandi psychosexual ethos touches on nearly every aspect of the real and ideal components of their erotic lives. Virginity for both boys and girls is not very highly prized in Nandi culture, especially before their rites of passage.

For girls, genital surgery during puberty ceremonies means clitoral excision or circumbustion of this organ; boys have their prepuces removed during comparable ceremonies by razor or by circumbustion. Both the Nandi and the Bagishu, also of East Africa, are said to prefer girls with sexual experience, reasoning that cohabitation with them is easier. Young men of these two tribes are reported to have little difficulty finding sexually accessible, uncircumcised sweethearts. Bryk observed that masturbation for both sexes is rather common among the Bantu-speaking tribes of East Africa, occurring much more rarely when adult social status is achieved. He also noted that female masturbation takes place among uncircumcised girls of the pastoral societies of SubSaharan East Africa. Nevertheless, girls, boys, women and men regard touching the vulva with the hand as unclean. Bagishu boys known to masturbate are punished by their parents with the reproach, "How can you take your penis into the same hand with which you eat?" Two Bagishu girls were observed to be masturbating with skinned bananas, and other phallocal objects apparently serve as autoerotic devices in the area.

Even in marriage, husbands in East Africa are said to never touch the pudenda of their wives; Bryk offers the opinion that husbands and lovers in these societies do not know how to make full use of the erogenous zones of their women. Presumably, this is a reference to the precoital fondling of the breasts, buttocks and mons veneris, since the clitoris has either been excised or charred away to a residual stump during rites of passage. Some digital autoerotic play involving the vagina, and perhaps the clitoris as well, occurs among the Maragoli and a few of the other pastoral tribes in the area. By his account, fellatio, anal sodomy and cunnilingus occur rarely, if ever, among the Nandi and the other pastoral peoples of East Africa who practice excision of the clitoris during rites of passage.

For the Nandi and other clitoris-excising pastoral tribes of East Africa, there is sufficient descriptive material on the psychosexual ethos within which such operations take place. There is, of course, far less material on Pharaonic Egypt, the earliest confirmed civilization in which genital operations took place on either sex. One impression of Ancient Egyptian

psychosexual values (Hussein, 1964) interprets the paintings and hieroglyphics on the temples built by the Egyptian Pharaohs as showing the great respect with which ancient Egyptians regarded sexual relations and the sacred aura which surrounded passionate love. Sex was considered the magic divine force by which man perpetuated himself on earth. To them the sexual relationship was so divine that even brother-sister marriages were permitted, although incest taboos of almost all other peoples forbid this behavior.

There are several problems involved in any discussion of the psychosexual ethos of the Arab Middle East, including the Sudan. Compared to Europe, it is true that the Arab culture world is relatively homogeneous, although within the area itself there are dramatic cultural differences. Corresponding to these cultural differences, there is great variation in sex life. Marked variations in attitudes and customs of a sexual nature exist among the urban, village and Bedouin populations. Such regions as the Arabian Peninsula, the Levant, the Nile and the Tigris-Euphrates valleys are the homes of diverse Arab subcultures.

The demand for premarital virginity of the Arab girl is ubiquitous, however, and comparable demands for premarital male virginity are not made. The Koran does not explicitly forbid prostitution but discourages forcing a girl into prostitution against her will. Although the Koran forbids or at least does not sanction, any form of female genital surgery except Sunna circumcision, Shandall and others have confirmed the existence in a number of regions of the Arab-Muslim culture world of both female infibulation and Pharaonic circumcision. Since both these varieties of genital surgery existed before the advent of Muhammed the Prophet, they were already an important element in pre-Islamic cultures, and conversion to Islam did not succeed in eradicating these ancient customs. Among the non-Muslim Somalis infibulation appears to function to prevent premarital coitus, but it is the psychosexual ethos of Muslim culture, not Sunna circumcision, which serves to reduce female, premarital sexuality via coitus.

A description of autoerotic practices among Arabs and Jews (19) notes several terms in Arabic for male masturbation, but

only one common term for female masturbation, that being *sahq*, signifying violent rubbing or sexual behavior. The Arabic terms *arrakeh* and *fettateh* are translated as "she who rubs" or "fricatrice." The male masturbator is commonly called a *zaliq*, the female a *sahiqueh*, both interpreted as derivative from *zalq*. It is the latter term which Edwardes renders as most equivalent to the English "jerking off." His impression is that Arab boys, regardless of whether they are circumcised or not, are more inclined to masturbate in groups than is true of Arab girls, and that in general boys in this culture engage in autoerotic play more frequently than girls. In an apparent allusion to Sunna circumcision, Edwardes feels that one of the post-operative effects is the tendency of the girl to be prone to habitual if not compulsive masturbation. Bonaparte has brought out that Freud was greatly influenced by the ethnographic studies of Felix Bryk among the Nandi, regarding this anthropological study of the clitoris-excising tribe as further proof of his contention that clitoral erogenicity is "infantile" and becomes transferred to the vagina as the girl matures to womanhood.

Edwardes emphatically disagrees with Freud, adding that:

Simple resection of the clitoral prepuce or hood, laying bare that tiny organ to direct stimulation, causes in the healing process a slight or severe burning itch analogous to that felt around the corona of a newly circumcised male. Compulsive rubbing is inevitable; and the supersensitive clitoris, being already swollen with the general irritation, adds to the aggravation. The old myth that clitoridectomy automatically transfers sensual response from the clitoris to the vagina is now exploded. Delicate, highly charged nerve roots always remain, reacting to friction sufficient to excite orgasm. Thus, instead of decreasing the masturbatory urge and decreasing the desire for vaginal intercourse, amputation of the clitoris effects little or no physical change but exaggerates the psychosexual impulses. Any nymphotomy or removal of the inner labia, also enacted to some extent in Islamic Africa, further complicates the matter. Frequently the female gains little or no satisfaction from vaginal penetration simply because she has been forced to accept it as a *sine qua non* of male gratification, and even those who respond to it do not lose their natural desire for extracoital contact.

Edwardes offers some fascinating insights into the cultural contexts of autoerotic behavior among Arabs and Jews in the Middle East, and it is unfortunate that he does not supply more specific ethnographic confirmation for his findings.

Regional and cultural differences in customs are quite marked throughout the area, and there has been some debate among students of the Middle East as to the extent and kinds of female genital surgery. Granqvist did not find these operations in the Muslim villages of Palestine she studied (4). Barclay, a cultural anthropologist, made a study of a Sudanese village, including sexual customs in genital surgery. He found that circumcision (*tuhuur*) is performed on both sexes. Male circumcision is not a puberty rite by which the boy is promoted to the next age-grade, as is true of the Nandi, but no boy in the Sudanese village would be regarded as a man until his circumcision. Genital surgery for both sexes takes place before physiological puberty. Both Pharaonic circumcision and infibulation are prevalent in the village, although both are regarded as *haraam* (prohibited) by the *'ulama*, jurists of Islamic law. Both operations were officially outlawed in the Sudan not long after World War Two. Nevertheless, both illegal operations persist in many areas of the Sudan and were far more prevalent in the village of Buurri al Lamaab than Sunna circumcision. Barclay found that many villagers believe the two more drastic operations are as much a part of being Muslim as male circumcision. Westerners who deride such beliefs should recall the vigor with which Latin masses, meatless Fridays and St. Christopher medals have been defended as "essential to Catholicism."

The illegal operations are sometimes performed by certified midwives; if these are not available, an unofficial midwife will be sought. The girl is usually taken to the Nile, often at night, where her face is first washed. Prior to the operation, the atmosphere is described as festive, with the girl being at the center of attention in this society for perhaps the first and only time. Girls receive new clothes and gifts and feel they are beginning to grow up. Infibulation and Pharaonic circumcision occur amid the accompanying cries, clapping and singing of attending women, these activities being designed to smother the shrieks and cries

of the victims. After the operation a girl remains confined to her house for forty days; she receives guests for the first fifteen, as after the birth of a child. A girl who is not Pharaonically circumcised or infibulated is teased by other girls, who accuse her of being a baby.

When a couple marry, intercourse may be almost impossible, if the infibulation has been so tight as to prevent intromission. One informant advised Barclay that in the "old days" a man would insert a candle into the woman before first coitus, in order to ensure the proper-sized opening. One folk belief is that local women are oversexed and that this undesirable condition is curtailed by infibulation. Most men in the village still believe in infibulation but Barclay noted that a growing number of younger men seemed to recognize the dangers of the practice; however, few men are said to be willing to forego circumcision of girls entirely. Younger men usually express a preference for Sunna circumcision. Of fifteen male informants, only one ventured the opinion that such operations were wrong because they decreased the sexual pleasure for women. There may be a more widespread and intense belief in infibulation among women than among men, since the chief perpetrators of these practices in the villages appear to be old women bent on preserving traditional ways. Many village men believe that Pharaonic circumcision somehow protects a woman from being sexually attacked, or from having illicit sexual relations, and that infibulation is good because by reducing the size of the opening, coitus is made more enjoyable for the men. As Barclay comments, the fact that women cannot experience sexual pleasure is not even considered. Buurri al Lamaab men apparently feel sometimes that it is a little indecent for a woman to enjoy sexual relations.

While infibulation and Pharaonic circumcision appear to be declining in some parts of the Muslim culture world, e.g., in Egypt, these ancient customs have only recently been culturally borrowed by the Moro, Tira and other hill tribes of the Kordofan (40). Among these recently Arabized hill tribes the psychosexual ethos includes age-grades for both sexes, elaborate puberty rituals involving male circumcision and the custom of female circumcision of the Pharaonic variety. Great stress has

always been placed on female, premarital virginity among the hill tribes. Pharaonic circumcision among them appears to have begun when men in the villages began to marry outside their own villages, bringing back circumcised Arab girls from other villages.

The literature on the psychosexual ethos of Australian aboriginal culture is abundant. As might be expected from the vast territory occupied by these people, there are regional and tribal variations in the culture. In Western Arnhem Land (7) some tribes were observed to lack rites of passage, performing neither penile subincision, male circumcision nor vaginal introcision. In the East Kimberly area, among some but not all tribal groups, such customs were found to still persist (31). Before considering the cultural context within which introcision of girls exists, it is worthwhile to take a look at some of the more or less commonly held psychosexual, culturally patterned behavior of the Aborigines, remembering that not all tribes are identical in cultural content. Except as otherwise indicated, the following material is based on the research of the Berndts in Arnhem Land.

At an early age, children of both sexes who sleep in their parents' camps observe coitus, which stimulates their desire to imitate such erotic acts. When such activities are carried out in play with other children of the same age, they usually cause much merriment and little worry. As Aboriginal children grow older, their sexual behavior resembles more closely that of adults and there is less public display of sexuality. Small boys and girls play naked together, and there is a tendency to choose companions of the opposite sex. The whole attitude towards sex is one of natural growth, and children's behavior elicits little adult censure or repression. A girl usually has her first coitus at about the age of nine years, although the boy rarely has coitus with ejaculation until he has passed through his first initiation ceremony. While the boy may just be embarking on his preliminary premarital intercourse, the girl of the same age may have already had five to six years of sexual experience and be capable of bearing her first child. By the time a boy and girl have mutually experimented in the sexual act, both turn to older partners to obtain more experience and enjoyment. The boy learns to savor

the experienced ease of the woman, the largeness of her breasts and vagina, the size of her labia majora and the erectness of her clitoris. The young girl, whose vagina has been prepared for normal adult coitus, turns to experienced, older men who have been indulging in sexual activities for years. She wants to feel the size of an adult penis that completely fills her vagina, as well as the strength behind a physically mature man's ejaculation and body pressure.

Jealousy is prominent in both pre- and extra-marital relations, so these affairs are usually carried out surreptitiously, and neither husband nor wife loses face. In contrast to the inferior social status and required pre-marital virginity of girls in the traditional Muslim culture world, the Aboriginal girl's status is economically, sexually and in other ways nearly equal to that of the Aboriginal boy. The principal interest of Aboriginal women is marriage, but at the same time extra-marital relations are the norm and are expected and enjoyed as additional spice to married sexual life. Nevertheless, extreme promiscuity has widespread disapproval and a woman indulging in it can be made the butt of jokes. Men may avail themselves of her sexual favors, but at the same time despise her for her "laxity."

The Berndts report that some women are satisfied only after a number of male ejaculations and that one intromission is "too quick" for them to reach orgasm. This may explain why some Aboriginal women desire the attentions of more than one man during a night, or have extra-marital coitus during the day or evening, when their husbands are away. Homosexuality among either sex is rare. Only one instance was cited in which a boy was known to have masturbated and there were no indications of female masturbation.

The Australian Aborigines have one of the few known cultures which places mythological importance on the clitoris (7). The *Djanggalawul*, used collectively, is a name given to three Ancestral Beings, usually Two Sisters and a Brother, whose ultimate origin is shrouded in antiquity, but who may be closely associated with the Sun. These sacred Ancestral Beings are said to have brought with them to Arnhem Land a variety of emblems, symbols of their cult, including the sacred poles known as *rang-*

ga. The *rangga* are so sacred that they are used only on ritual ground and may be seen only by fully initiated men or neophytes, although women know of their existence and can describe their appearance and significance. The *rangga*, yam stick and other phalloidal objects are interpreted by the Aborigines themselves as penis symbols. They are hidden and removed from time to time, symbolizing coitus. Waterholes themselves are vulva symbols, used often in song and mythology. Trees are penis symbols and their roots called by the term used for penis. A great deal of this erotic symbolism is expressed in sacred ritual, posturing and actions. The most important focus in the *Djanggawul* is the emphasis upon procreation.

In some drawings, the Two Sisters are depicted with people or children "flowing out" from their vulvas. The *Djanggawul* have abnormally long genitalia. The Brother has an elongated penis, emphasizing his role in procreation. The Two Sisters have enormously long clitorises, for which the Aborigines offer no explanation, except that the *rangga*, or sacred poles, may have derived from them. When the penis and the clitorises of the *Djanggawul* were eventually shortened, it is said that the severed parts became *rangga*, or feathered strings. Berndt feels that the elongated clitorises can possibly be explained by the tendency to accentuate a female organ, or that they symbolically represent the umbilical cord. He regards the former explanation as more probable and points out the considerable stress placed in daily life on the erectness of the clitoris during coitus. The clitorises of many Aboriginal women are fairly well developed; they are played with and handled by women from before adolescence in order to increase their size, attract the attentions of men and heighten the sexual satisfactions of both partners. Drawings from the Yirrkalla area illustrate these ideals. In one illustration, the Two Sisters are shown with lengthened clitorises, and the Brother with his long penis; they are all holding *rangga*.

Kaberry's impressions (31) of the Womeri and Ngadi tribes' rites of passage is that where introcision was deemed necessary before marriage, such rites seem to be the counterpart of male subincision. Among the Lunga, introcision is not practiced, and they denied that it ever occurred among them. The Ngadi be-

lieve that introcision facilitates sexual intercourse and delivery at birth, as do some of the Queensland tribes. There are myths of girls' first initiation ceremonies, menstruation and introcision rituals. In one version, a female totemic ancestor tried to subincise young girls and "make them into men" but they developed into young women anyway. Women did not seem jealous of the secret male subincision rites, from which they are strictly barred. Instead, the women seemed to feel pity for the "poor fellow" undergoing this painful rite. The women had myths in which female totemic ancestors were responsible for birth, onset of puberty, menstruation and introcision.

It is believed that this rite must be performed secretly, away from men, or else it has injurious after-effects on the girl. Like subincision for men, introcision is often seen as a preparation for marriage and is carried out under the direction of old women. It has taboos and mythical sanctions and rituals which sacralize the operations, so as to allegedly reduce the pain and dangers accompanying this genital surgery on girls.

THE CLITORIS IN POLYNESIAN AND MICRONESIAN CULTURES

Studies of Polynesian and Micronesian societies illuminate the variety of ways that the clitoris may be perceived through the lenses of different cultures. The pre-European attitude towards human sexuality in Polynesia can be described as frank, appreciative and realistic. Sexual pleasure was never considered sinful, repulsive or evil. This culture lacked the intense, romantic conception of love as a kind of mysterious force, a concept present in Western civilization since the Middle Ages. Polynesians saw coitus as simple and natural, like eating and drinking. Masturbation for both girls and boys occurred without adult censure and adults sometimes urged their children to play with themselves when peace and quiet were sought. Sexual matters were discussed in an open, unembarrassed manner (15). No attempts were made to suppress erotic behavior in the very young; as children grew older they learned to play various games in imitation of their parents and elders, including sexual play. Coitus

sometimes took place outdoors and on the beaches, occasionally in the presence of the younger children. Dances of an erotic nature were common.

Rites of passage for the Polynesian boy approaching biological puberty included superincision of the prepuce. In most islands of Central Polynesia this was performed by an expert, older male and the custom still persists. The older man not only makes the cut, but has the additional task of instructing the boy in practical aspects of sexuality (35). Marshall indicates that the superincised penis is still tantamount to a passport to sexual adventure in this society. No more deadly insult has yet been devised by the Polynesians than to publicly call a man unsuperincised, or to imply that his penis bears resultant smegma. In contrast to many cultures, the Polynesian called for male genital surgery, but not for female genital alteration. In pre-Christian Polynesia, girls received family and public attention during rites of passage, with attention focussed on the deliberate enlargement of the clitoris. Marshall observes the retention of surviving auxiliary habits connected with this custom, e.g., discussions of the size, length and shape of the clitoris still persisting as a common topic of conversation for all age and sex groups.

In the Polynesian lexicon, many synonyms exist for the female genitalia. In both Samoa and in New Zealand there are six terms for the clitoris, and nine exist in the Tuamotos. Nine or more terms for male genitalia were found among the Maori of New Zealand; some twenty items in the Maori lexicon refer to female genitalia. Marshall stresses that only in Polynesia is there any apparent need to classify the shape of the clitoris as to three or more degrees of pointedness. Much of the focus in Polynesian culture patterns was oriented around attempts to enlarge the clitoris, and to provide formal sexual instruction for the young. This sexual training provided the young girls and boys with a basis for their future extended erotic activities with a large number of successive partners. The one sexual term absent from the lexicon of the Polynesians is an equivalent for our word "virgin"!

Polynesian art employed rather naturalistic depictions of the human body. The Maori of New Zealand graphically portrayed

human genitalia and coitus on meeting houses, homes, reliefs carved over doorways, on weapons, canoes, paddles and even on artifacts designed for tilling the soil. They illustrated manual play with genitalia, fellatio and cunnilingus. Elsewhere in Polynesia the remains of sacred shrines still show emphasis upon the enlarged clitoris and the grossly large or receptively presented vagina.

Multiple orgasms are highly desired and sought by both sexes. Bringing about female orgasm, or a series of them, continues to be the goal of the Polynesian male lover. Marshall comments that the Polynesian woman, young or old, lovely or unattractive, looks forward to orgasm as her birthright, regardless of the wealth, status, or social rank of her sex partner. If her spouse cannot bring about these moments of joy, she seeks a lover who will suit her needs, despite possible danger to her marriage. In quarrels between Polynesian mates, the subsequent achievement of mutual orgasm releases tensions and restores harmony, reuniting the bonds between the partners. The Polynesian male, hearing for the first time of those European and American women who have never achieved orgasm, may ask with concern whether this will not result in damage to their health.

Micronesian culture shows great interest in the size of the external female genitalia also. In Ponape, efforts are made to enlarge the clitoris and the labia minora, a task assigned to impotent old men (16). The Trukese woman whose vulva is "full of things" is believed to attain orgasm more rapidly than other women. These highly desired "things" include a prominent clitoris, labia minora and abundant pubic hair. Ethnographic study of Truk (26) showed that the tattooing found on the upper and inner thighs of the women acted as a strong, erotic stimulant to the men. Devereaux felt that the tattooing functioned to make the women even more sexually alluring, because her genitals seemed unusually "full of things." Trukese women made these "things" not only visible, but also audible. They perforated the labia and inserted objects which tinkled as they walked, with their legs slightly apart. The possession of a vagina "full of things" is so important to the women of Truk that arguing women may accuse each other of having "nothing" in their gen-

italia. Gladwin and Sarason cite one incident in which two women exposed themselves in public, allowing spectators to judge the quality of their genitalia. The woman judged to be less well-equipped appeared greatly humiliated. They observed that women who do not regard their genitalia as sufficiently full of things will not allow their sex partners to either see or manipulate their organs, although coitus may be permitted.

Devereaux indicated the great role played by the clitoris in the sex lives of Trukese women and men. Another anthropologist, Goodenough, has conjectured that female orgasm on Truk seems predominantly clitoral. In sexual foreplay men are said to first rub the penis against the clitoris before inserting it. Full penetration is achieved only when the woman begins to have an orgasm. Citing field work done earlier in the area by Finsch in 1880, Devereaux has shown how a Ponape man stimulates a woman's labia between his teeth, in a tugging and pulling motion reminiscent of fellatio. Trukese women enjoy urinating during sexual foreplay, associating this emission with orgasm. Devereaux has pointed out that women on Truk also enjoy having a man urinate in them, after both have had an orgasm. Trukese men demand their women achieve orgasm first, with high value assigned to those capable of clitoral orgasm. In Devereaux's opinion, Micronesian women wish to duplicate male ejaculation by urinating at orgasm. Perhaps he overlooks the involuntary orgasmic loss of urine, which is not rare in American women.

SUMMARY

Daly, a psychoanalytic writer (13) has theorized that all peoples have passed through a phase in the evolution of their cultures in which circumcision for both sexes once existed. He has further assumed in his unilinear theory of the evolution of human culture that at some early but unspecified period, matriarchy was widespread, if not universal. I know of no reliable anthropological evidence to support either of these sweeping assumptions. It is true that rites of passage or puberty customs are cultural universals. Some form or surgery is also a component of every known prehistoric and contemporary culture. How-

ever, few peoples seem to have hit on the idea of genital operations, even when these same peoples practice rites of passage. Nor is there any evidence that the varieties of genital operations for either sex are less prevalent now than in the era of Pharaonic Egypt. The idea of genital operations scarcely existed in the pre-white cultures of the New World, Siberia, Eastern Asia or in prehistoric or historic Europe north of the Mediterranean. Assuming the validity of the slim evidence for vaginal infibulation among the Conibo Indians of South America, then it would seem that this operation was independently invented at some time in the prehistoric past, both in the New World and perhaps also in North Africa. The vaginal introcision present among some of the preliterate Australians appears to have been invented only once in human culture history.

Tribal, SubSaharan Africa was, and still is, characterized by a wide variety of clitoris-reducing operations, the most common of which is simple excision, customarily done as part of the rites of passage. I find it hard to believe that all such clitoridectomy can be traced to a single origin in Pharaonic Egypt. I feel that clitoral excision was invented many times, what anthropologists call independent invention, and that some peoples in this part of East Africa got the idea from others by the process of cultural borrowing. I believe that some of the ideas of genital operation present in Pharaonic Egypt, specifically infibulation, Pharaonic circumcision and perhaps also, male circumcision, have persisted from the Pharaonic past. These ideas probably spread southwards by diffusion, remaining in the region in certain pre-Islamic Arabic cultures. When the religious ideas of Muhammed the Prophet spread throughout North Africa and the Near East, these older customs of female genital surgery were not entirely displaced, despite the fact that the Koran sanctions only Sunna circumcision. It may be that these ancient surgical practices of infibulation and Pharaonic circumcision fitted in nicely with the psychosexual ethos of Muslim cultural values, which stressed ensuring premarital female virginity, lack of importance of female sexual pleasure, and the lower social status ascribed to women. In any event, the persistence of traditional culture is such that it is not surprising to find survivals of such seemingly ancient

forms of genital surgery in this part of the world. North Africa has long been a cross-roads for the blending of old and new cultural elements into distinctive, new combinations.

It is probably no accident that the most drastic and painful types of female genital surgery have been preserved in a region with such culture traits as great social isolation between the sexes, heavy emphasis on the dominant male role, a traditional art forbidding realistic representation of the human form, strict standards of modesty in dress and a downgrading of the sexual pleasure women may be expected to enjoy in coitus. Hussein, a Muslim scholar, speaking collectively of the practices of "cliterotomy" in the region, has even suggested that the high divorce rates in the area may be due in part to the relative inability of Arab women to achieve sexual satisfaction in marriage after genital surgery.

In 1953, Marie Bonaparte remarked that the peoples of the world may be considered as either friends or enemies of the clitoris. She regarded those people who excise or reduce the organ as its enemies. Peoples who distend the clitoris and labia for erotic purposes she felt were friends of the clitoris. Peoples who practice vaginal infibulation and Pharaonic circumcision can be readily identified as enemies. The Polynesians and Micronesians certainly fall into the description of friends of the clitoris. However, the great majority of peoples of the world lack the idea of female genital surgery or manual enlargement of the female genitalia. To extend the analogy of Bonaparte, I regard most of the peoples of the world as neutral observers of the clitoris. Except for the *Djanggalawul* myths of the Australian Aborigines and a small number of legends from Central India explaining the creation of the clitoris, this organ is poorly represented in world mythology and folklore. Except as already indicated in Polynesia and Micronesia and among the prehistoric Mochica people of Peru, the clitoris rarely appears as a motif in the preliterate art of the world. In some languages, only one or two terms exist for this organ. In Western civilization, few jokes have ever been recorded about the clitoris except for the so-called "man in the boat" stories.

A kind of occupational folklore developed within the medical

profession in the West in the nineteenth century, and a small number of surgeons saw the clitoris as the locus of nymphomania. Excision was used as a cure for "excessive masturbation," epilepsy and mental retardation. The practice of declitorization in Europe coincided with the discovery of preliterate genital operations in Africa by European explorers. I find no causal connection between these two events.

Adhesions of the clitoris are not uncommon, and at least some patients may benefit from circumcision. In the United States, clitoral research has advanced greatly with the pioneering motion picture work and laboratory studies of Masters and Johnson. If their subjects had clitoral adhesions or surgically reduced female genitalia, none were reported.

As Western culture spreads and as medical knowledge of the clitoris grows, it seems predictable that Pharaonic circumcision and vaginal infibulation, already beginning to decline, will someday disappear. This is already happening in the Sudan, where the scientific and humanitarian work of Shandall and others have introduced anaesthetics to midwives; Sunna circumcision is being encouraged as a substitution for the traditional, drastic forms of surgery. We have shown how the lens of culture affects the perception of the clitoris, and how the psychosexual ethos interrelates with the type of female genital surgery practices. New anthropological field studies of the clitoris and genital surgery may give us further understanding.

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Chapter XI

SOME NOTES ON THE ETYMOLOGY OF THE WORD "CLITORIS"

Thomas P. Lowry

Psycholinguistics is the science of language applied to human behavior. One aspect of this science is what words people choose for objects and the emotional tone attached to that usage, such as shame, contempt, pride or anxiety.

Linguistic analysis is an enormously complex subject into which the novice ventures at his own risk. The perils of two of my psychiatric colleagues may illustrate this. In 1943, Abram Blau (1) stated that "... except for scientific terminology, there seems to be no vernacular, slang or obscene word in the English or American language to designate this organ." Blau claimed that in eleven other languages there was a similar deficiency, and concluded that the absence of vernacular terms indicated "... extreme cultural suppression of female sexuality." He based this on the theory of castration anxiety, i.e., having only a clitoris unconsciously means the penis was amputated, so let's not talk about the clitoris or give it a name.

In 1945, Leo Kanner (2), in the same journal, produced a list of forty synonyms for the clitoris, but hastened to add that these items were contributed "... not for the sake of argument but mainly with the purpose of supplementing the data ... in Dr. Blau's article." Kanner, truly a courtly colleague, concludes that, "Dr. Blau is right in his main thesis."

Table VIII indicates the immodesty of another essay into this field, since the possibilities are so vast. Nevertheless, two things seem worth attempting: first, following the derivation of the word "clitoris" itself and, secondly, describing the psycholinguistics of the terms in other languages.

The traditional derivation is that, in classical Greek *kleitoris* was derived from *kleien* (to shut or to sheathe), or from *kleis* (a key) or that it means literally "hillock," from a word *kleitor*, which survives in the name of the Arcadian town of Kleitor.

TABLE VIII

SOME LANGUAGE FAMILIES OUTSIDE THE WESTERN HEMISPHERE

- I. Indo-European Family
 - A. Germanic (English, Flemish, Dutch, Icelandic, Danish, Yiddish)
 - B. Celtic (Welsh, Gaelic)
 - C. Italic (Latin, Spanish, Italian, Portuguese, Romanian)
 - D. Albanian
 - E. Greek (Classic, Middle, Modern)
 - F. Baltic (Lithuanian, Latvian)
 - G. Slavic (Russian, Polish, Czech, Slovene, Bulgarian)
 - H. Iranian (Persian, Kurdish)
 - I. Indic (Sanskrit*, Pali, Hindi, Urdu, Bengali)
- II. Semitic Family
 - A. Akkadian (Babylonian*, Assyrian*)
 - B. Canaanite (Phoenician*, Ugaritic*, Hebrew)
 - C. Aramaic (Biblical Aramaic*, Syriac)
 - D. Arabic (At least six types of arabic)
 - E. Ethiopic (Amharic, Tigré)
 - F. Hamito-Semitic (Ancient Egyptian*, Coptic)
 - G. Hamitic (Berber, Tuareg, Algerian)
 - H. Cushitic (Somali, Galla)
- III. Turkic Family
 - A. East Turkic (Altai, Kizil)
 - B. West Turkic (Kirghiz, Bashkir)
 - C. Tatar (Kashgar, Uzbek)
 - D. South Turkic (Standard Turkish)
- IV. Sino-Tibetan Family
 - A. Tibeto-Burman (Tibetan, Kachin, Burman, Naga)
 - B. Karen (Karen, Kayah)
 - C. Sinitic (At least six types of Chinese)
 - D. Meo-Yao (Meo, Yao)
- V. Thai Family
 - A. Thai (Black Thai, Lao, Siamese)
- VI. Austro-Asiatic Family
 - A. Viet (Vietnamese, Muong)
 - B. Mon-Khmer (At least 57 languages)
- VII. Japanese Family
 - A. Japanese (No known congener)
- VIII. Korean Family
 - A. Korean (No known congener)
- IX. Mongolic Family
 - A. Eastern (Mongolian, Urga, South Mongolian)
 - B. Western (Oirat, Kobdo Oirat)
- X. Finno-Ugric Family
 - A. Finno-Permian (Finnish, Estonian, Permian, Lappish)
 - B. Ugric (Hungarian, Vogul)
- XI. Malayo-Polynesian Family
 - A. Indonesian (Malay, Javanese, Balinese, Tagalog)
 - B. Polynesian (Hawaiian, Samoan, Tahitian, Tuamotu)

XII. Dravidian Family

- A. Tamil-Kurukh (Malayalam, Tamil)
- B. Kanarese (Kulu, Kota, Toda)
- C. Telugu
- D. Central Dravidian (Gondhi, Bhil)
- E. Brahui

NOTE: The capital letter headings indicate subfamilies. In parentheses are some of the principal languages within each subfamily. Asterisks mark dead languages.

However, Marcel Cohen (3), a great French philologist, says it's not so. The *Dictionnaire étymologique de la langue grecque* does not contain the word *kleitoris*; in effect, it is not a word of classical Greek. The word first appears as an anatomical term in the works of Rufus of Ephesus (ca. 100 A.D.). In the next century, Pollux Archaeologus used it in a similar way, giving the spelling *klētoris*. The word appears again in Hesychius, in the sixth century and 500 years later in the works of Suidas. Its transmission to north Europe is unclear, but it first appeared there in Cotgrave's French-English dictionary of 1611. None of this supports the traditional Greek origin.

Cohen, on admittedly fragile evidence, suggests that a search in India might be fruitful, since one of the lost books of Aristotle, in a passage dealing with the Indus River, describes a dark precious stone called *klitoris*, which the natives wear as an earring. Another possible pathway is from the ancient Egyptian *k³t*, meaning vulva. In "new Egyptian" there is the term *kṛnt*, best translated as "penis pocket." On the coast of Somalia, *kintir* means "clitoris," while in Tigré, another coastal Ethiopic language, "clitoris" is *quantirat*. Farther south, in Gourague, the word is *qēntēr*. In Harari, another Ethiopic dialect, we find *qintir*.

The basic consonant framework is clearly *qnṭr* or *kntr*. By exchanging the liquid sounds *el* and *n* one finds the consonants of the Greek (*kltr*); the equivalence of the nasal liquid *n* and the liquid *el* is frequent in Semitic languages; examples abound in Akkadian and Phoenician. Cohen concludes that *kleitoris* originated outside of Greek and bears a strong resemblance to synonyms in living Ethiopic languages.

Since the word "clitoris" has become established in English (a basic international language for scientists) it has been absorbed

into the technical and everyday vocabularies of many nations, either with the English spelling or in some transliteration: *clitoride*, *klitoris*, *kliitor*, *ku-ri-to-ri-su*. Thus wherever "clitoris" originally came from, it has probably returned.

American and British English seem to contain a few common terms and many obscure ones. The most usual is "man in the boat" (var. "boy in the boat"), referring, of course, to the glans surrounded by prepuce and labia. This term was in use before World War I and probably centuries earlier, and appears on at least one jazz record, *The Boy in the Boat* (Paramount 14010-B) recorded by George Hannah and Meade Lux Lewis in 1930. The opening stanza is:

Now did you ever hear the story 'bout the boy in the boat?
 Don't wear no shoes or no overcoat.
 Broad told me it happened like this: he loved to dive and
 also to fish.
 He went roaming in that shallow boat, with head hardly
 rising
 And his eyes popped to go.
 Face is all wrinkled and his breath smell like smoke.
 Talking about that boy in the boat.

Another synonym is "button." In 1936, Lil Johnson recorded *Press my Button, Ring my Bell* (Vocalion 03199) and in 1929, Bessie Smith sang *I'm wild about that Thing* (Columbia 14427-D):

What't the Matter, papa, please don't stall.
 Don't you know I love it, and want it all?
 I'm wild about that thing; Just give my bell a ring.
 You pressed my button; I'm wild about that thing.

The Boy in the Boat seems to be identical to *The St. Louis Tickler* (4); both were frequent request numbers for the jazz bands that played in the now-gone sporting houses (5).

H.L. Mencken, in *The American Language*, states: "A chick's clitoris is the little man in the boat or among butch lesbians

who are spectacularly endowed, a spare tongue." The same term is also seen in "spur tongue"; both are usually regarded as Lesbian or working-class negro terms.

D.W. Maurer, the noted authority on underworld argot and confidence games, provides a plethora of synonyms from his studies: "Miss Horner" is from the character Horner in Wycherly's *The Country Wife*, and has the meaning of the agent which causes cuckoldry. "Spot" was much used by married women of a generation or two ago, and survives in "to hit the spot" now that the sexual meaning is forgotten. "Stud" (in the sense of a protuberance) is used in a boastful sense by Lesbians, who are proud of the size of their clitoris; the term may also refer to the woman herself or, of course, to a wellhung man. "Cock" is used among Lesbians to indicate a butch clitoris; south of the Mason-Dixon line "cock" is widely used by heterosexuals to indicate the vulva and/or clitoris. "Prick" is used in the same way by butch Lesbians. "Jolly" is largely a British usage; with orgasm, a woman "gets her jollies." "Heater" is common among narcotic addicts, who find conventional intercourse difficult, from the physical effects of opiates, and satisfy their women with tongue or finger. If the woman is the addict, the opiates tend to decrease her natural lubrication and patient attention to the clitoris is essential. "Crest" is possibly from British-Australian rhyming slang—crested hen, Lesbian. "Comb" is from the rooster's comb, referring to the erect clitoris. "Nuts" is much used by pimps and prostitutes, derived from the woman "getting her nuts off." "Horn" is most likely related to the image of "riding the horn (pommel)" while "in the saddle." A "muzzler" is a girl who unobtrusively rubs her clitoris against an attractive man in crowded places like subways, and achieves orgasm. A "jasper" can be either the clitoris or a bull Lesbian. A "horsecock" is a large clitoris. The term is borrowed from the drag queens and is always used about someone else, in either a derogatory or adulatory sense.

Cary (6) lists many other English synonyms, all of which are highly metaphorical, literary and/or seldom used: "cherry" (usually means hymen), "cock's crest," "fleshy excrescence," "fleshy knob," "fud tongue," "goad of Venus," "joyspot,"

"nose," "nymph," "peeping sentinel," "piece of flesh," "seat of pleasure," "sensitive spot," "tongue," "treasure," and "zither." Thus we see at least thirty-three known words for the clitoris in the English language division of the Germanic subfamily of the Indo-European language family.

What distinguishes a language family is that all the members are derived from a parent language and the results of this heritage can be traced in many similar words for common objects. Thus for "mother" we have *mātr* (Sanskrit), *móðir* (Icelandic), *mãe* (Portuguese), *moder* (Swedish), *mor* (Danish), *mutter* (German), *mère* (French), *moeder* (Dutch), *mama* (Rumanian) and *madre* (Spanish and Italian). It will be interesting to see if such striking similarities occur as we trace the words for "clitoris," a word used far less often than "mother," through the various language groupings.

THE INDO-EUROPEAN FAMILY

The Germanic sub-family includes English, which we have partially discussed. The English word "tickle" derives from *citelian* (Anglo-Saxon) into *kittle* (Scottish) and then to "tickle." In both medical and household German, *Kitzler* means "clitoris," literally "tickler." In Danish, the usual word is *clitoris* (var. *klitoris*); *kildrer* ("tickler"), which is first known in an 18th century midwifery textbook, is little used. A Danish physician (7) suggests that the Danes are interested in "normal" sexual intercourse and have little interest in other sexual avenues. The Norwegians use *kildrer*; the Swedish say *kittlaren*, while the Dutch use *kittelaar*.

A Belgian physician (8) contributes some notes on Flemish philology: the technical word is *kittelaar*, while popular usage has *wrat* (wart), *boon* (bean), *erwt* (pea) and *het ding* (the thing). The vulva is popularly *prut*, a derogatory term, seen in such terms as *prutswerk* (work which is poorly or shoddily done); a less common vernacular term is *viool* (violin)—that which is played with a fiddlestick. The haired pubis is sometimes *muis* (mouse) and in French is *chat* (cat, pussy). The region of the perineum and anus, both male and female, is *gat* (hole) or

kont, which probably resembles the vulgar French *con* (vulva), and is probably related to the vulgar English *cunt*, which forms the play on words in *King Henry the Fifth*, III, iv, 47, in which Katherine, daughter of Charles VI mistakes *count* for *con*. All of these may relate to *cunnus* (medical term for the pubic triangle), from the Latin *cuneus* (wedge). Psycholinguistically, the Flemish terms have a negative tone and seem to imply derogation of the female genitals. As a final Lowland note, in Walloon, the language of southern Belgium, the word for "clitoris" is *linwette*.

Papyamentu, the language of Curacao, is a remarkable creolization of Dutch and Spanish. There are at least forty terms for aspects of the female genitalia and the general tenor is one of affection and goodwill. In addition to *clitoris*, used medically, there are *rintintin* (little toy), *lèrchi* (also meaning labia), *tapa-tapa di lèrchi* (*lèrchi's* cover), *klep di lèrchi* (tip of the *lèrchi*), *reberensya di tonto* (Span., lit. reverence of the vulva), *e kos de lèle* (the thing to play with), *tapa di donchin* (cover of the *donchin*), *kliit* and *djipopo* (Jack-in-the-Box) (9). Of interest are three contrasting words for "vulva": *konchi* (Dutch, *kont*, plus *je*, dimin.), fairly widely used; *skochi* (Dutch, little lap) which is used by refined, old-style upper-class speakers; and *konyo* (? Span.) which is widely used as an insulting term.

The Celtic sub-family includes Irish Gaelic, where "clitoris" is *brille* (gossip, bungler or fooler). In Scots Gaelic, the term is *brilleann* (var. *brillen*) which is related to *brilleineach*, meaning "lewd"; altogether a gloomy view of these matters.

The Italic sub-family is an echo of the Roman Empire. Cary (6) is a rich source of Latin synonyms: *caruncula* (a little piece of flesh), *crista* (cock's crest), *epiderus*, *murton* (myrtle berry), *Venus and nympha*. Kanner (2) gives *columella* (little pillar), *virga* (twig), *oestrus veneris* (love's frenzy), *contemptum vivorum* (living belittler), *mania*, *dulcedo amoris* (love's sweetness), *sedes delectationis* (seat of delight) and *tentigo* (from *tendo*, from its powers of erection). Hyrtl (10) adds *penis*, *mentula* (penis), *cauda* (tail) and *coles* (penis), most of which are followed by *muliebris* (of a woman). Most of these terms, pleasant as they are, probably saw little popular use.

Italian dictionaries give *clitoride*; *allegria* (gladness) is de-

scribed in the Camorra dialect; other terms of rarer usage are *ribrenzuolo* (seat of shivers) and *brimborion*. The French have not neglected these matters: Cary (6) gives *aileron petit* (little wing), *animal*, *bijou* (jewel), *bouton* (button), *corde sensible*, *languette* (little tongue), *nez* (nose), *nymphé*, *point*, and, once again, *le petit bonhomme dans le bateau*. Vernacular Spanish uses similar analogies, with *pepita* (little seed) and *lenguita* (little tongue). Other terms in frequent use, according to Maurer, are *cuerpo* (body), *pequeño cuerpo* (little body), and *cuerpo redondo* (round body). *Pica* is probably confined to Cuban police usage, and is related to *pica electrica*, an electrode applied to the clitoris of a woman being interrogated; this technique was much used under Batista, but may still continue. Spanish, Portuguese and Romanian dictionaries all list transliterations of "clitoris."

The most widely used Slavic language is Russian, where "clitoris" is the medical term, transliterated into the Cyrillic alphabet. The other dictionary term is *pokhotnik* (lust). Official Soviet policy is quite prudish, which may account for the scarcity of published terms. In Polish, *Łechtaczka* is used, variously translated as tickler, delighter or titillater; *Łaskotka* is also used, with its meaning obscure. The usual Czech term is *poštěvaček* (instigator, inciter, stirrer-up).

In the South Slavic languages, Serbo-Croatian, in addition to *klitoris* has *dražica* (teaser, stimulator) and *sekiļ* or *sjekiļ* (tickler). Bulgarian doctors use the Cyrillic transliteration, while the vernacular term is *ezi'che*, meaning "a small tongue," or in engineering, "the cam to operate the bolt in a lock." A translation copy of *kitzler* is sometimes used, namely *gúdelnik* (11).

Persian, closely related to Sanskrit, is derived from Old Persian, spoken in the Iranian highlands millenia ago, and recently infiltrated with Arabic elements. In Iran today, there are two words for "clitoris" in common use: *chocholeh*, whose origin is obscure, is used in Tehran; the northern part of Iran uses *zal*, because the clitoris resembles the shape of a Persian letter of the same name (12).

The mother of the Indic languages is Sanskrit, which derived from a more ancient Indic-Vedic dialect about 2000 B.C. Sanskrit was the language of the educated of India by 400 B.C. and

the extinct Akkadian languages. Northern West Semitic comprises the Canaanite and Aramaic groups, while Southern West Semitic has the Arabic and Ethiopic languages. Hittite is sometimes associated with the ancient Semitic languages because it employed cuneiform writing, but it belongs to the Indo-European family. The few Hittite sexual anatomy words known are: *kattan-kan kuit harzi* (that which she has below), *sal-natar* (womanhood) and *aššu pedan* (the good place); none of these are specific to the clitoris (16).

Akkadian is a general term and embraces Assyrian (2800 B.C.-650 B.C.) and Babylonian (650 B.C. *et seq.*). In neither language is "clitoris" clearly discernible, but many pubic area references are known (17). *Biššūru* seems to mean vagina, since texts specifically refer to the penis entering the *biššūru*; the word has persisted nearly 5000 years and appears in classical Arabic today as *bathur* or *baẓr*. *Ūru* has been translated euphemistically as "nakedness" and boldly as "cunt"; archeologists have found votive pubic triangles of clay, specifically called *ūru*. *Laqlaqqu* is translated either as "stork" (which fits a "birdy" motif) or as a repeated imperative form of the verb *laqā'um* (to take), literally "take-take." *Guruš-garaš* is derived from *garasu* (copulate) and is an informal and/or obscene term, not unlike the Late Babylonian *niki-niki* (copulate-copulate).^{*} *Handuttu* has been rendered as "the coy one who winces." *Maqallu* (var. *maqlalu*) is literally "the lesser" or "how puny it is." The last three terms are known only in specialist's word lists. *Lipiššatu* corresponds to unclear expressions in Sumerian, such as *kur-papah* (Mountain of the Sanctuaries). Sumerian, spoken in Mesopotamia from 4000 B.C. to around 300 B.C., has no affiliation with any other known language; ancient bilingual dictionaries tell us that *biššūru* was the same as the Sumerian *galla* and that *laqlaqqu* corresponds to *zarah*.

The Canaanite languages are dead, except for Hebrew. The Phoenicians left few anatomical writings; their interest was com-

^{*}Hymes points out that most colloquial terms for copulation fall into two classes: hard and soft. The former are consonant-enclosed ("fuck," "bang") or contain initial expiratory consonants, in a cluster, such as "screw." The latter use reduplication, as in *gurus-garas*, *niki-niki*, *pom-pom* (Tagalog), *shibi-shibi* (Korean), *budgy-budgy* (Wishram Chinook), *yo-yo* (Tagalog contact vernacular).

mercial records; Ugaritic leaves us only one vulvar synonymon: *qrd*, pronounced *qirbu*, meaning literally, "midst." There are no references to the clitoris in either the Bible or the Talmud; this may not be surprising, since the Orthodox Jew chants every morning, "Blessed art thou, O Lord Our God, King of the Universe, who hast not made me a woman." Modern Hebrew has a few expressions that are not widely used, but were coined for purposes of anatomical description and teaching. *Dagdegān* is derived from the verb *digdēg* (to tickle) which is first seen in medieval Hebrew. *Hamdān* appears first in medieval Hebrew and bears the meaning "covetous, lustful person." *Hebyônūt* is the feminine form of *hebyôn*, a noun meaning "a hiding place," which occurs once in biblical Hebrew (Habakkuk 3:4) and has been used in this meaning ever since. *Bāṭār* is of unknown origin. Finally, there is a straight transliteration of "clitoris" into the Hebrew alphabet. There appears to be no vernacular term (18).

Syriac is almost the only living remnant of the language spoken by Christ. Modern Syriac dictionaries list four words, all poorly attested and also said to mean "foreskin." *Bath âsâ* is literally "daughter (berry) of the myrtle," an exact equivalent of the Latin *murton*. *Gla^ctâ* is given simply as "clitoris." *Kîptâ* is possibly from *keppthâ*, "vault"; *kallthâ* is literally "bride" (19). Aramaic contains *bissuro*, meaning "her flesh," and seemingly derived from Akkadian. North Arabic, the sacred tongue of Islam and the common literary language of 40 million people, is usually referred to simply as Arabic; there are many dialects. South Arabic dates back to 900 B.C. and is used today only on the southern coast of Arabia and the island of Soqothri. Arabic origins are discussed in the chapter by Z.T. Faruki.

Amharic is the principal and official language of Ethiopia; it is the daily vernacular of 3 million people; the other 19 million Ethiopians speak a variety of other Hamito-Semitic tongues. My informant, who asked anonymity, wrote, "There is little to be said about words relating to sexual matters in Ethiopia, where though people are certainly much concerned with sex in practice, it is in a somewhat unsophisticated (unpornographical) way. For instance, the same word (*shint*) is used both for urine and

for semen, despite the extreme physiological and functional differences. The word for 'clitoris' is *quintär*, sometimes transliterated as *quinter*. The word *bellet* is used to refer to organs severed from the body, but also has the meaning of individual body parts, especially 'penis' (properly *qwella*) and 'clitoris,' as determined by the context."

Ancient Egyptian spanned 4000 years and had several major evolutions: Old Egyptian (3400-2200 B.C.) was largely pictographic; Middle Egyptian (2200-1580 B.C.) was pictographic, alphabetic and syllabic, with further reliance on "determinatives" which described the type of word which it preceded. New Egyptian (1580 B.C.-3rd century A.D.) saw the rise of Demotic, a largely different writing system, the influence of Rome and Greece, and an emphasis on legal documents; New Egyptian merged into Coptic and disappeared. To further confusion, hieroglyphics were also written in a cursive script and there are no vowels; finally body parts present some of the most difficult translation problems. Whether any term known ever meant "clitoris" solely is unknown (20).

In Old Egyptian, "vulva" was sometimes written as a triangle, apex down. Since it was often shown split, and since "copulate" was written as a penis entering the triangle, this pictogram seems clear. Middle Egyptian is the source of the other terms. The words (shown in Fig. 5) are a mixture of pictograph, alphabet and syllable. No. 1, pronounced "h" is "a well full of water" and also "female organ." No. 2 is "t" and means "a bread loaf." No. 3 is an ideogram, the bicornuate heifer uterus (resembling an IUD!). No. 4 is "a piece of flesh" and is a determinative meaning "body part." No. 5 is *hmt* meaning "uterus" or "vulva." No. 6 has the same meaning; no. 7 means "uterus"; no. 8 is *k³t* meaning "vulva" or "vagina." No. 9, also *k³t*, has "lock of hair" as the determinative and means "vulva." No. 10, *šd*, means "vagina"; with a "stone block" determinative, it means "a grinding mortar." No. 11 and 12, *sp·ty*, means "two lips" or "lips of the vagina"; no. 13 is *sp·ty šd*, meaning "labia majora." No. 14, *r³n hmt* is "orifice of the uterus." No. 15 is "belly" or "private parts." No. 16, *mwt rmt* is "uterus," literally "mother of men." No. 17, *te·t* is "vulva," which appears in Demotic and becomes

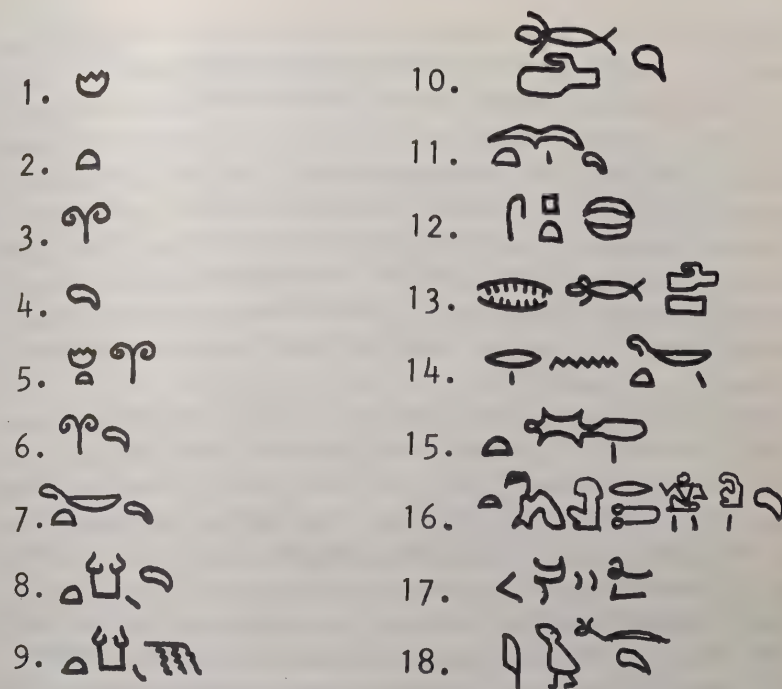


Figure 35. Egyptian hieroglyphic genital terms. See text.

OOTE in Coptic. Finally, no. 18, *iwf*, literally "chair," is a euphemistic "vulva." Three thousand years later it is hard to resurrect connotations, but it does seem that Middle Egyptian sexual attitudes were straightforward and unashamed.

The Turkic language family includes the native tongues of 40 million people. Half these speak Turkish, in which the usual colloquial term is *fercin dilciği*, from *fercin* (sparrow), *dil* (tongue) and *cigi* (a diminutive ending). Medical dictionaries give *bizir*, related of course to *bathur* and *bi'sşuru*; *Clitoris* is also standard medical Turkish. As a coincidence, the totally unrelated *ferç* means "vulva" (21).

THE SINO-TIBETAN FAMILY

One quarter of the world's people speak these tongues, which are tone languages, using variations in pitch to distinguish mean-

ing. They are analytic in structure, using invariable monosyllabic words and relying on word order to express grammar.

In Tibet, medical doctors never examine the female organs; this taboo extends to language—there are no polite terms for “clitoris,” but there are two obscene ones. The most common is *bya le*. One derivation is *bya* (“action,” from *bya-ba-byed*, “to do work,” meaning coitus) and *le* meaning anything of no particular shape, hence “action bump.” Another suggestion is *bya*, “chicken” and *lce le*, “tongue.” A third informant suggests *cha-li* (hanging piece). The second word is *sran ma me tog*, literally “flower of a pea pod” (22).

Chinese has been a living language for about three thousand years. The written characters are standard but can be pronounced in several ways; they also form the basis for written Japanese, a totally separate language. The English transliterations of the Chinese are National Romanization, followed in parentheses by other common ways of noting the same word. The old literary general term for “clitoris” is *yuh-tair* (*yü-tai*, *ju t'ai*), “jade terrace.” *Yuh* is the character meaning feminine beauty. The glans clitoridis itself, in old literary usage, is *ji-she* (*chi shê*), “chicken’s tongue”; the same characters in Japanese are pronounced *hinasaki*. *Chwu-shian* (*ch’u hsien*) is also of old literary usage and is literally “chicken’s tongue.” Other old literary terms are *chow-shuu* (*ch’ou shu*), “smelly mouse,” and *chyn-shyan* (*ch’in hsien*) “lute string.” The statement, “The lutes are in harmony” means marital happiness.

The clitoral area has at least four synonyms which begin with the character *in* (*yin*), which is the *yin* of *yin-yang*. *Yin* is all those aspects of being which are feminine, dark, passive, earth-derived, moist and/or shaded. *In dow* (*yin tdou*) is literary, but not of refined usage, and means “feminine bean.” *In ti* (*yin t’i*), “feminine peduncle,” is of formal, medical or technical usage. *In her* (*yin hê*), “feminine kernel” is widely used in learned or neutral settings; the same characters are used for “clitoris” in Korean and Japanese; the latter pronounce it *inkaku*. The character *her*, standing alone, is the Japanese vernacular *sane*, also meaning “clitoris.” *In tiing* (*yin tin*), “feminine rectus” indicates the erection capacity of this organ and is used in literary but

unrefined settings; *tiing* alone is the name of a female disease (23). Chinese “clitoris” terms seem to reflect a long, rich history of sexual thought and a fine regard for delicate modes of expression.

In Thai (Siamese) one can choose among the technical, educated *awaya pruk kamnad setri pêt* (member arousing desire in the female), the flowery *pum kasan* (desire knob) and *méd lamut* (point of the *lamut* fruit); for vulgar usage there is *tét*. The Thai love metaphors from nature; classical Thai poetry has passages where the vulva of the beloved is compared to the lotus flower, with the clitoris as one part of it (24).

In Vietnamese, there are two terms of Sino-Vietnamese origin: *âm hạch* (lit. hidden kernel, perhaps from Chin. *in her*), used technically and *tuốc noãn* (bird’s egg). Other terms, of unknown origin and usage, are *hột xẻ* (divided kernel), *trúng chim* (bird’s egg) and *hột đậu* (bean) (25).

Japanese, surprisingly to Westerners, is totally unrelated to both Chinese and Korean, even though it uses many Chinese characters. “Sex in Japan is universally enjoyed (though without much imagination or variety) while at the same time being considered ‘low class.’ Women of middle class and above don’t use words regarding their genitals. Men use such words according to class and occasion. There is little emphasis on genital terminology in Japanese pornography. Japanese women apparently all masturbate, but you don’t need to know the word for it to do that” (26). The usual dictionary word is *inkaku*, used medically and in popular conversation; a modern learned form is for both men and women to use the English, pronounced *ko-ri-tu-ri-su*. In common usage is *hinasaki* (“chicken’s tongue”), derived from the peak in the stiff hats worn from the tenth century down to the late nineteenth. Vulgar slang is *ikite iru mame* (“living bean”). A low class bar joke goes, “Do you like beans? Yes, if they are living!”; everybody laughs. *Sane* (“seed”) is a popular term and the one usually encountered in modern pornographic literature; it is perfectly respectable in middle-lower class conversation. To sum up, the Japanese are more governed by social class conventions than by any concept of “dirtiness” in sex.

In Korean, the Chinese characters *in her* can be used, pro-

nounced on *haeck*; this is technical medical usage. The vernacular *konyal* is the more informal term. Knowledge about nuances of social usage is lacking (27).

Mongolic languages can be classed alone, or as a subdivision of Ural-Altaic. Standard Mongolian dictionaries omit "clitoris," but our informant gives a term transliterated from Cyrillic, as *okhsog*, a derivative from the vulgar verb *okho* ("to have intercourse"). The Western Mongolian (Kalmyk) dictionary gives a term, phonetically *čōčig*, with a literary spelling of *čoučiq*, defined by the Russian term *sikel*, which the Soviet dictionaries refuse to define, due to official prudery! (29)

The Finno-Ugric family has extreme agglutinative structure; no word has both front and back vowels (vowel harmony). In Finnish, the literary word is *hävynkieli*, a simple compound of *hävyn* and *kiele* ("vagina tongue"); the identical vulgar word is *vitunkiele* ("cunt tongue") with the slang term substituted for the medical. In the closely related Estonian, the word *häbedvsmokad* seems to be a direct loan-translation from the German "shame lips." Other Estonian words are *kōdisti* ("tickler") and *kliitor*. The Hungarian (Magyar) is *csíkló* ("tickler"), clearly derived from the German *Kitzler*.

THE MALAYO-POLYNESIAN FAMILY

This includes languages spoken in much of Southeast Asia and in the vast sweep of the South Pacific. Indonesian includes about 200 languages and dialects; Malay, a native or second tongue for 80 million people, is the official language of Indonesia. An Indonesian Moslem custom illustrates the high regard in which the clitoris is held. When a girl is somewhere between the ages of three and ten, there is a ritual washing of the clitoris. The little girl reclines on a ceremonial bed, under which incense is burnt and around which a fine cloth screen stands. A religious official does the sprinkling, using *air setaman*, a watery solution of sweet-smelling flower petals. Afterwards, the family provides a celebration feast, according to their financial status. In a culture so respectful of the clitoris, we will not be surprised to find a warm, accepting vocabulary.

Javanese language varies on the basis of social rank. Common speech, used for low to low or high to low, uses *itil*, which occurs most frequently in Central and East Java. *Itil* seems derived from *kontrol* (penis) which becomes *kontil* (dim.) which is shortened to *itil*. Another suggested derivation is from *itik-itik* (tickle). Polite speech, used for high to high or low to high, employs *kělěntit*, but some intimacy is required. Extremely high Javanese uses *prono* seen only in traditional court poetry, and derived from the Sanskrit *prana* (breath, soul). In Javanese, *prono* also connotes the heart as the seat of the emotions.*

Malay shares with Javanese the word *itil*. *Kuntum piari* (love-bud) is used poetically. The Malay *tampok labu* (calabas stump) is used jokingly for a large clitoris. *Titik*, meaning point or (punctuation) period, is used in Balinese slang. In the Padang area of Sumatra, the word used is *bidji* (seed). The dictionary also gives *sěnggeh* of unknown usage (29). Tagalog, the official language of the Philippines, has *puki* for "vulva" and *tinggil* for "clitoris." The Visayan (Waray) dialect spoken on Samar uses *poyet* or *podoy* for "vulva" and *tusik* or *tuding* for "clitoris." The words are in common usage; pride or shame can vary with the situation (30).

Malinowski, who studied the famous Trobriand Islanders, noted their novel ideas of sexual function: "In the process of sexual excitement in the female, the eyes give the alarm, which passes through the *wotuna* (communicating ducts), takes possession of the kidneys and produces sexual excitation of the *kasesa* (clitoris)." The Trobrianders had names for the clitoris and vagina, but, curiously, none for the labia or the vulva as a whole.

The Tuamotuans of Polynesia have ten different words for "clitoris," reflecting the sexual focus of their culture; *arero* (tongue); *io* (gash); *io-io*; *tiro* (uvula); *tiro-tiro*; *kai-ivi* (eat ridge), *toke* (worm); *kiko* (naked flesh); *teo* (new growth); and *taio* (31). The Fijians use *toitoi* and *cui*; these must not be used

*A contrary note is introduced by the anonymous author of *Praeputii Incisio*, who states that around age seven, Javanese girls have a small part of the clitoris removed in a ceremony called *putingitil*.

publicly or before women. The central New Hebrides Islanders on Nguna and Emau use *napati ni siviri* (parrot's beak) which is also taboo in front of woman. The Tahitians say *tira* (mast of a boat); the Dehu, Loyalty Islanders use *he-ne-fiju* (head of the vulva); the Samoans use *masisi*, *tela* and *tole* (32). Hawaiian terms are *ke'o*, *i'o'l'o* and *kanaka*, which also means a type of man. The Australian aborigines speak over one hundred utterly unrelated languages; we have data on two. The Mullukmulluk use *pan-moel* (eye of the vulva), while the Yir-yoront use *kot nanpr*. *Kot* means vulva or vagina and comes from *kont*, the native word for a melon (*Melo amphora*) of vulvar appearance.

The Dravidian family of languages, spoken by over 100 million persons in central and southern India, is wholly distinct from the Indo-European languages, such as Sanskrit. In Kota, "clitoris" is *kuṭ*, (related to words for banner, crest of a bird, nipple, point and extremity). In Tulu, *kūdi* is variously translated as "vulva, posteriors, or membrum muliebre." In Tamil and in Malayalam, *kūti* also has those meanings. The Tamil word *punṭai*, also meaning the female pudendum, may give rise to the English slang of "poontang." The migration of words, both carried by ancient travellers and by British colonialists the last few centuries must give origin to many surprising connections between cultures (33).

NATIVE AMERICAN LANGUAGES

The dozens of linguistic families of the natives of North and South America defy summarization. Widely different families exist a few miles apart. The complexity has been compounded by the over-refinement of many field workers who failed to ask about sexual terminology; a double pity, since now many of the languages are dying or dead. The dictionaries made by Christian missionaries contain few sexual terms; however, there is some information available

In Maidu (northern California) *pysim eni* is literally "vulva tongue." In Wappo (northern California) *sinis* means both "clitoris" and "uvula," being derived from *sine* (sprout). In the Yakima dialect of Sahaptin (central Washington) *smt'ik* means

"clitoris." The *sm* prefix indicates the pubic area, and appears in related form in *shmtay* (pubic hair) and in cognate forms in the Nez Perce language: e.g., *simteey* (pubic hair) and *simke* (penis). The meaning of the *-t'ik* stem is not determinable.

In the Nass-Gitksan (northern British Columbia) language *dul'ts* is "clitoris." Nass-Gitksan society is highly stratified, with an elaborate heraldry of family crests which are displayed on totem poles, clothes and elsewhere. A few years ago, one of the more important display crests of the *sim lax xs giik* (Real Eagle) clan of the Eagle phratry in the village of Gitlakdamix was *dul'ts sim'oogit* (Clitoris Chief). The crest appeared on a wooden ceremonial dish, carved in the shape of a vagina, which was displayed and used at potlaches. The usual Nass-Gitksan term for "cunnilingus" is *luu ts'eeḱ* (literally, "to inside-lick"); occasionally speakers use the incorporated compound verb *ts'eeḱ dul'ts* ("to lick clitoris").

In the Klamath language of Oregon, the word for "clitoris" is *si-ts*, pronounced like "seats." The Hopi language of Arizona uses *mosinga*. The etymology of both is unknown (34).

It is hard to escape the imprinting of one's own culture and time, but the study of language and custom can help cure personal myopia. I have found special help in this from such sources as G.R. Taylor's *Sex in History*, Wayland Young's *Eros Denied* and Benjamin Whorf's *Language, Thought and Reality*.

This brief essay may indicate some of the light to be shed by a thorough study of the etymology of sexual terms. Perhaps a professional scholar in philology or linguistics will use these modest beginnings and pursue the etymology of "clitoris" with real scope and depth.

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Chapter XII

REFLECTIONS ON THE ETYMOLOGY OF "CLITORIS" IN ARABIAN SEXUAL LORE

Zuhdi T. Faruki

The universal Classical term in Arabic for the "clitoris," or the Greek *kleitoris*, is: *bathor*, or *bathur*.^{*} The derivation of the Arabic term is from the verb *bathara*, meaning to sprout, to grow. The noun, hence, means growth, protrusion, sprout. The noun is masculine and singular. Its plural is formed by a modification in the movement accompanying the letters, as shown, which means a volume of growth, many sprouts. The term in its plural form could be legitimately used to denote a mass phenomena, such as would apply to the production and generation of many individuals of a class. It is peculiar that in its singular form it is used exclusively to denote the "clitoris."

While the Classical Arabic is uniform in all Arabian countries from the Western approaches of Pakistan to the distant shores of the Western extremities of North Africa, local dialects and colloquial traditions vary considerably to such an extent that each folk dialect may be said, indeed, to stand apart as a distinct and independent tongue. Thus, literate people understand the meaning, origin and derivation of the Classical term for "clitoris," but the common mass have improvised their own terms for the celebrated organ. Such vernacular and vulgar terms also derive from a common Classical origin, each being the simile or metaphor of a poetic image that has come to dominance among a people, denoting a singled-out quality or meaning which emphasizes a particular function or feeling. Following is a partial list of the vernacular references to the clitoris in various Arab lands.

^{*}The phonetics of the term *bathor* in Arabic make it necessary that the "th" in the term be pronounced as the "th" in "the" or "that," and not as the "th" in "threat." This is a mellow or a flat "z", but not as harsh or as sharp as our "z". Again, the two vowels in *bathor* ought to be pronounced in a short, snappy manner without extending their breath.

bathur, singular	بَظْر	noona	نُونَة
bathur, plural	بَظِير	zarzoor	زَرْزُور
zanbur	زَبْبُور	felfoula	فَلْفُولَة
antoot	تَنْطُوط	tar tooi	طَر طُور
innawa	يَنْنَاوَة	akrooten	عَكْر وُتْن
forms of the letter "noon":	ن ن ن ن		

Figure 36. Arabic terms for clitoris. See text.

Syria, Palestine, Lebanon and Egypt: In this central and substantial portion of the Arab heartland, the term in popular usage for the clitoris is: *zanbur*. *Zanbur* stands in Arabic for the drone, the wasp. Obviously, this is a metaphorical frame of reference, and scholarship among the common people attempts perpetually to furnish an interpretation as to the rationale of the term. Two qualities which characterize the genesis, function and nature of this sexual organ may furnish a credible interpretation which may account for calling it by a name after the wasp or the drone. When excited, the clitoris vibrates, erects, is restive and almost flutters as though it is a little bird. Likening it to a bird, or a birdy, as we shall see, is by no means uncommon in other Arab communities. In the second place, the "zanbur," meaning the male bee, enjoys a reputation of being nasty on account of its sting. While the clitoris does not sting a phallus in its approach, it is said to do so to its owner. In the heat of sexual excitement, among inhabitants of warm climates infinitely more than among Western or Nordic girls, the females writhe in incredible agony, often scream, bite, toss in heat, and are veritably wild with passion. This center of sensitivity imparts a degree of discomfort, so that when the girl complains of the congestion of lust, and of the scorching fire of desire, develops distorted features, and tosses helplessly as though she were in a frying pan, it is not too far fetched, to harken to her exaggeration that "a drone must have slipped between my legs, and is playing havoc with its bites."

Southern Iraq: The term for clitoris here is: *antoot*. This vulgar (i.e., common or illiterate) term connotes a diminutive something which is terribly restive, jittery, hopping, eager and in extreme anxiety.

Baghdad and Northern Iraq: The common term here is: *innawa*. This could easily be the diminutive of *ein*, which is Arabic for "eye." This is mere conjecture on my part, as the derivation of the term *innawa* denotes a possible linguistic relation to *ein*. Nor is it far fetched to suppose that the name is applied as the single eye that guards, oversees, dominates or otherwise receives the impulses on behalf of the entire region.

Libya: The common term for the clitoris here is: *noona*. "Noon" is the letter "n" in the Arabian alphabet. When you say "noona" you have first made it feminine, then made it singular, one of a kind, and lastly you have converted it into the diminutive mode. It is not uncommon in Arabic literary lore that subtle, mysterious and generally inscrutable objects may acquire a semantic appellation from one single letter of the alphabet. This practice is frequent in Arabian learned literature, and in the Qoranic Holy Scriptures. In the context of sexual lore, ancient books on sexology, both learned and vulgar, refer to the ability and vigor for love-making, also the quality of being abundant in semen among men, as possessing vitality or vigor or "the B." One additional possibility of interpreting such a metaphor abides with reference to the written Arabic form of "n," which possess four different forms, depending upon whether it occurs alone, is joined to the preceding letter, is joined to the preceding and following letters, or is joined to the following letter only, as shown, respectively, in Fig. 36. The little upward stroke in the last two versions of *noon*, is called in Arabic a "chair," and on it sits a lone dot. Might it not be that the clitoris, which sits small and alone, yet crucial in meaning, could be called by the name of that letter?

Tunisia, Algiers: The clitoris here is called: *zarzoor*. *Zarzoor* is Arabic for the starling, an extremely puny, fast, quaint birdy. Certain white, neat, extremely attractive and symmetrical vaginas have been called a *zarzoor* in some popular tales. But you also find the correction of such a misnomer, and the reference of *zarzoor* only to the clitoris.

Dr. William R. Mast adds that in the El-Milia district near Constantine, Algeria, the local term for "clitoris" is *felfoula*, derived from the Algerian word *felfel*, or from the Classical Arabic *foufouloun*, both meaning "red pepper." The staple pepper eaten in Algeria has a short stem protruding from the base; the stem is called *cherdouda*, "an extra piece of meat," and it is that part that the clitoris is compared with. There is much borrowed French in Algerian Arabic, and two other common terms for "clitoris" are *chapeau* (hat), and *petite coquette* (little flirt).

Morocco: The clitoris here is called: *tartour*. *Tartour* stands in colloquial Arabic for the crest, such as that of a cock or rooster, also such as the white of an ocean wave. The lore here speaks of the "feurdj abu tartour." This is, the "vagina of the crest." (Neither vagina nor vulva is the correct translation for neither of them signifies the whole organ of copulation in women, as "feurdj" does.)

Southern Morocco & Mauritania: The term for clitoris is: *akrooten*. However, since it is listed sometimes as *akurten*, let me assert here the very imprecise nature of the enterprise. As the Berber language has no elaborate grammar, or stable and scientific structure of derivation; also, in view of the fact that different dialects dominate different regions in the vast expanses of that land, ranging from the North Atlas, through the Middle Atlas, across the Anti-Atlas to the plateau of Mauritania and its desert shores, it is quite reasonable to assume that *akurten* may be in use among some Berber tribes. It may be a vulgar corruption of *akruten*, for I conjecture that *akruten* spells out more loyally the nature of Arabic linguistics than *akurten*.

Persia: The terms listed elsewhere, namely *zal* and *chocholeh*, are authentic. Now, *zal* ought to be written *thal*, provided that the "th" in it be enunciated as the "th" in "the" or in "that," and not as the "th" in "threat" or in "thick." *Zal* itself is the ninth letter in the Arabian alphabet, used also by the Persians. Refer please to the above discussion on using single letters to denote a subtle referent. *Zal* qualifies here equally as *noon*. *Chocholeh* is not the best Latin rendering of the term. I should prefer either of the following: *shosholeh* or *jojoleh*. I believe it means in common Persian, a plaything, a toy.

The listing of *qintir* and its variations under some North-East African headings is, I believe, correct; *qintir*, alias *qintar*, means a certain measure of weight. I am sure it is heavier than our ton, but cannot say how heavy, perhaps a hundred times as heavy. It is not a sense of exaggeration to reverse the order of things and call so small an organ as the clitoris by a name denoting so crude and enormous a referent as a *qintar* or even a ton. What is being labeled here is not the actual physical organ, but its function and role in the game of love.

COMMENTARY

The Arab East abounds in manuscripts, volumes of love tales, and countless books and pamphlets ranging in their treatment from the broad and popular field of mass entertainment, to what is referred to as precise sexology, the science of love-making, the rejuvenation of youth and similar titles. Practically nowhere in those annals and tales would the reader come across derogatory references which belittle human worth, or connote an implication of guilt, shame or baseness. Shame and guilt are not part of the sexual lore of the Arab Muslim East. The grounds for substantiating this claim exist readily in available literature, history, theology and various facets of social life. The one outstanding quality in the Oriental approach to the issue of sex, in the opinion of a celebrated authority among the Orientalists, is "... where the feeling for the human extends almost to the sacred heights of transfiguration, banishing every vestige of the shame." This is most evident in the tales and books the Arabs wrote on the practice of sex. Here, "... in life, in literature, as in art, the act of love is expressed with an entire abandon, a complete and wholesome joy; and is accepted as presenting, in its fundamental essence, something of the activity of the Divine itself. It is for this reason that Islam in particular looks upon chastity not as an ideal, but as an unfortunate accident." The quotation is from the Introduction, written by the learned and brilliant sexologist Allan Hull Walton, to Burton's translation of Nefzawi's *The Perfumed Garden*, which has invaded our local market only in recent years. Let me attract your attention

also to the invaluable and revealing Terminal Essay of Sir Richard Burton, included in his singular translation of the *Arabian Nights*.

Learned scholars and public lecturers never, of course, have occasion to refer publicly and openly to sexual practices or organs in the East. A modicum of modesty prevailed until the present. However, today, in literary circles, in homes and cafe houses, conversation quite often turns to this delicious topic. I have witnessed and participated in such occasions from the banks of the Tigris and Euphrates in Iraq, to the celebrated and cultured cafe houses of Cairo and Alexandria, to the literate colloquiums of Syria and Lebanon, to many a friendly circle across North Africa. Among groups of cognate inclinations and symmetry of age, prudery is at a minimum, and often is referred to as the "incapacity for passion, parading as virtue."

Conversations in such societies abound with references to the clitoris, for indeed its function and nature were heeded, and discussed since ages ago. Often, some men betray genuine fear of women with a developed clitoris, for this would mean that such women are well-nigh insatiable. Such an insatiability is naturally different from that of nymphomaniacs, for the latter never achieve it, while the former never have enough thereof. Besides, a woman with a sensitive and developed clitoris is extremely demanding; and would not hesitate to "stick horns on her man's head" in her perpetual endeavor to seek love. I believe this was the predominant grounds for circumcising woman.

Now, as to the technique of circumcising women, it was usually part of the vulva, the lesser lips thereof, called nymphs, that were trimmed. In cases where the clitoris extended to unusual or abnormal proportions, it, too, got the knife. This was done with an eye of mercy on the future fortune of women. The practice was widespread, further south towards the equator, and was done, as with the male, right after birth. This indiscriminate practice was common in Egypt, only a generation or two ago. I know from experience that physicians in major Egyptian cities, starting about the First World War and since, have turned down any request for female circumcision among the masses. While this practice probably came to an end in the north and in

big cities and among established families, I am inclined to think that in Upper Egypt, littered with poor and hard working peasantry, the precautionary measure remains as much an accepted rite as male circumcision. The effect of eradicating or shortening the clitoris in girls, unmistakable in later years, is to substantially lessen and almost mortify the lust for love making. Stories are told about women in warm climates who escaped circumcision: now they are pathetic victims of the perpetual fire that nothing can quench.

Other stories have it that some varieties of clitoris might actually resume growth after being circumcised to the root. I have no way of verifying this, but I know from first-hand experience that women in the entire Arab East have no trouble locating, understanding, and accommodating the clitoris and its function. It usually, and if left alone without trimming, grows, often dangles, and always is central and extremely sensitive in the love act. I am stressing this point, because it strikes me as being in sharp contrast to the genesis and development of the organ in Western and Nordic women. Some of those latter variety hardly show a protrusion at all. If I were engaged in coining a term for its manifestation in Western and Nordic women, even as the ancient Arab writers were engaged in locating a fit simile, I would not hesitate in calling it, as it is manifest in Western women, by such names as: "dot," "button," or "point."

In the popular literature of sexual lore, the clitoris, together with the entire vagina, has acquired some of the most colorful and romantic appellations. Narrators and writers do not hesitate to quote the Holy Scriptures when they speak of the sexual organs; and often speak of them, of the vagina especially, as the delicious, the delectable, the hot one, the beautiful, the aromatic, the accommodating, and other such congenial epithets. While several prominent Arabian authors include in their writing hints, recipes or whole chapters on ways of eradicating the odor emanating from the vagina, the practice of cunnilingus, or kissing and sucking the clitoris alone, has apparently not been known or followed by most men in Arab lands. I would say they decidedly did not know it, or need it, as they were normally not denied, and denial is the root of extremities of human

behavior. The situation perhaps is undergoing a change, especially after the prolonged periods of colonialism Arabs suffered under the British, and more so under the French. When you come nowadays, in open conversation among the intelligentsia, the bourgeoisie, and the upper and upper middle classes, across references to variations in techniques of love making, you ought not to be surprised; for the East is modifying a great deal of its tradition, way of life and practices.*

In a recent diary I read written by a Beirut, Lebanon high-brow-highclass call girl, she was most explicit on the central issue of the clitoris in her business. She recalls that among her clients, the old welcomed a chance to suckle on the clitoris, and some of them would seek cunnilingus hungrily. She had a great deal of difficulty accommodating them, not because the refined practice displeased her, but because she invariably achieved blissful and repeated orgasm with this efficient method, and just "did not want to be touched after that." She also mentions that she would not allow the majority of her younger customers to indulge in the practice. The reason she gave for this is the certainty she felt "that sucking the clitoris, equally as cunnilingus, and just the same as fellatio, were addictive practices, habit forming, and end by conditioning the lover to them as a necessary condition of his love making." I am inclined to agree with her, for I heard the same assertion from Parisian girls. The Beirut call-girl narrated a few cases of Lesbian, passionate love among some of her friends. She was not interested, herself, but was astounded by the persistent, concentrated and sustained role the clitoris played in such relations. It fed the fire, and sustained the relation beyond the limits of emotional attachment. Her implication was, I believe, that without full exploitation of the sensitive organ, such an innocent and pure relation would not last beyond the casual and emotional tie, which has narrow limits. Truly an organ of many values and many aspects.

*One illustration of this point is the extreme popularity and high regard local enlightened, liberal and enterprising circles in Cairo, Beirut, Baghdad, Tripoli, Tunis and Marrakesh hold *My Life & Loves*, by Frank Harris. It is ignored by American youth but in Europe, as in the East, it is emulated. This is a casual and objective observation, and is not meant to imply value judgments.

Chapter XIII

THE CULTURAL PSYCHOLOGY OF THE CLITORIS

Thomas P. Lowry

We begin to realize that our brains are the most complex and self-determining things in the known universe. After all the measurements of atoms and galaxies are folded into laws in some corner of our networks, there will still be universes of interrelationships in the rest of our networks to be discovered. If this property of complexity could somehow be transformed into visible brightness so that it would stand forth more clearly to our senses, the biological world becomes a walking field of light compared to the physical world. The sun with its great eruptions would fade to a pale simplicity compared to a rosebush. An earthworm would be a beacon, a dog would be a city of light, and human beings would stand out like blazing suns of complexity, flashing bursts of meaning to each other through the dull night of the physical world between. We would hurt each other's eyes. Look at the haloed heads of your rare and complex companions. Is it not so? (36)

It is so, and sexuality is one of the most complex things possessed by already complex human beings. To select one organ of all those related to sexuality may seem a foolish simplification and to fragment this pink button of tissue among several specialists may seem even more foolish, yet it is worthwhile, for the careful examination of the infinitesimal must yield understanding of the infinite. This essay, on the meaning of the clitoris, will range far beyond that organ as an isolated entity.

There are at least two ways to examine a subject: the reductionistic and the synthetic. The reductionistic approach follows the rule of "nothing but" (Mary is nothing but an hysteric; the world is just a ship of fools; patriotism is just a shield for scoundrels). Objects are categorized at a single level of complexity and then dismissed. The synthetic approach relies on the principle of hierarchies.

Arthur Koestler has brilliantly clarified the necessity of the latter approach. "Hierarchy" here is used not as a simple sequence of rank, like a pecking order, but as a special type of

organization with ascending levels of control, similar to the military lines of command. In most animals the cells form various tubes, the tubes form organs, the organs form organ systems (respiratory, reproductive, etc.), and the systems finally form an entire person. At every level, there is partial autonomy and partial dependency. The heart can beat without consulting the brain; an individual muscle cell can contract even if cut away from the heart; a muscle enzyme may still be potent even if separated from its parent cell. Yet an enzyme is not the muscle cell; the muscle cell is not the heart; the heart is not the athlete. Their independence is only partial.

As in the military, there is delegation of power: the general does not command each soldier directly but controls through several levels of officers. There is also delegation of responsibility: the private is responsible for himself and also to the sergeant, but not directly to the general. Further, neither the general nor the aggregate of privates constitute the division. It is the total of all the levels of the military hierarchy, responsible both upward and downward, that constitutes the division. The division in turn faces upward into another hierarchy—the division is part of an army, the army is part of the defense department and the defense department is part of the government.

Injury, like organization, can go up and down the hierarchical tree. If a man neglects his diet, his organ systems suffer. A "rebellious" or self-directed organ system can create mischief for the total man: witness the involuntary tic or the unexpected erection or the stomach which is too acid. A single cell which steps out of line may begin a cancer. A single defective gene may affect not only the whole body, but the social and economic levels open to the damaged person.

Skills and habits also take on hierarchical forms. A beginning music student learns about individual notes, learns then to combine them into chords and may go on to activities at further levels of complexity, such as transposing from one key to another, playing while hearing other musicians, and composing music for many instruments, using sophisticated harmonies.

In considering the clitoris from the point of view of hierarchical analysis, I visualize eight levels of complexity:

1. The cosmic
2. The species-wide
3. The societal
4. The familial
5. The adult interpersonal
6. The adult intrapersonal
7. The anatomical
8. The electrochemical

THE COSMIC LEVEL

The cosmic realm includes such clearly extraterrestrial problems as the clitorides of beings from other planets (little data so far), concepts of God's attitude towards sex (largely a societal problem) and the cosmic bliss of orgasm (which is probably an intrapersonal matter). Religious sexuality is more highly developed in Asia, and one of the clearest English language expositions of this is in the writings of C.M. Chen, a Buddhist yogi. Since I am better versed in anatomy than theology, this will be discussed under the former.

THE SPECIES-WIDE LEVEL

The species-wide level of organization includes those qualities characteristic of all *Homo sapiens*. Our foremost feature is complexity. The introductory statement by John Platt says in a few words what has taken me years to learn: that the human body and its functions surpass all other systems in possible permutations and variations. Eyes-open psychiatry is a royal road to a sense of awe. Human complexity insures that all statements about our companions must be qualified and tentative.

A second major aspect of humanness is speech. The sounds made by dogs, monkeys and parrots are quanta jumps below the speech of the average three-year-old child. No one but us has the mouth or the mind to babble, to combine practiced babbles into imitative words and through that indefinable process, understanding, to speak on our own. External and internal speech, through which we can conceptualize and manipulate imagined

ideas and objects, leads to philosophy and to the ability to think about our thinking. What ape ever puzzled over the meaning of its primateness? Of all the mammals, only the cetaceans match our complexity. The porpoise's chatter and the humpback whale's song may match our Demosthenes, but if they are smarter, why haven't they decoded *our* chatter?

As to the species-wide anatomy of *Homo sapiens*, we all begin life with a clitoris! At the sixth week after conception, each of us anatomically was a tiny girl, floating inside the uterus and ready for the next communication from our genes. However, the half of us who became boys felt, at about the sixth week, the effect of a testicular inductor substance which stimulated our fetal androgens and suppressed the growth of our ovaries. Thus the penis is an exaggerated clitoris rather than the clitoris being a poor cousin to the penis. These events will take on special importance during later consideration of Freudian female psychology (42).

Finally, the female *Homo sapiens* differs from ewes, does, mares and all other female creatures in that she is the only one to have orgasm (3). Being equivalent to the male in ecstatic experience makes her unlike any other mammalian female. The meaning in the field of morality seems tremendous: human sexuality is not meant only for reproduction. In fact, very few sexual contacts do, or should, lead to conception.

Not only will the earth not hold all the babies we can make, but natural law, if it is to be based on nature rather than some theologian's perversions of nature, seems to say to most of mankind, but especially to woman, "Your lot is perhaps to bear children, but not just that. Your sexuality contains the possibility of experience which is close to mystical; you can establish with your mate a shared life whose depth is far beyond mere economic, legal and gonadal necessity; your unique orgasmic power is a sign unto you of the breadth of woman's potential." No wonder Platt sees our complexity as not just a blazing beacon, but as an awesome living sun.

THE SOCIETAL LEVEL

The societal level of organization, or sub-whole, comprises those areas usually included in sociology and anthropology. As Ben Huelsman has elaborated, societal groups can have totally opposite beliefs about the clitoris. Most Polynesian societies, until bowdlerized by Christian missionaries, made a policy of encouraging clitoral enlargement and held public inspections at the temple, where the priest would measure each maiden's clitoris while she was spread-eagled on an altarstone equivalent to a gynecologist's table. This was an occasion, not of shame, but pride and excitement, analogous in meaning to western society's coming-out parties and debutante balls.

In violent contrast we see the custom, widespread in North-east Africa, of slashing off the clitoris with broken glass, old razor blades or pieces of flint, in an operation as painful and degrading as it is mutilating. Our indignation should be tempered with the knowledge that a cleaner version of the same operation was often performed by our grandparents' generation as a "cure" for masturbation. The ancient Chinese did not mutilate the clitoris, but did consider a large one unsightly; classical Chinese erotic art almost never shows the clitoris.

Kinsey's studies form the first extensive examination of the sociology of sex. He found that sexual beliefs and practices varied from class to class more than from nation to nation (at least in Euro-American societies). What a Liverpool dockworker does in bed is more like a San Francisco dockworker than it is like the performance of the Englishman who owns the dock in Liverpool. In general, the working classes have the least interest in sexual anatomy and elaborate or prolonged sexual encounters, while the educated classes are just the opposite. The lower classes regard the upper classes as effete, perverted and jaded, while the upper classes view the sexual behavior of the workers as promiscuous, animal-like and unimaginative. Social mobility may increasingly obscure these differences, but in bed there are few Pygmalions, and a person's amatory preferences are a surer clue to his social station than is his income. A dry statistic may underscore this point: among Kinsey's 33-year-old male subjects

with a primary school education, 19 per cent had any oral-genital contacts with their wife; for the same age group who had some college, the figure is 49 per cent.

The laws governing sex in the United States seem to have been written entirely to enforce lower class practices, since in most states it is a felony to do anything sexual, except "straight" intercourse with one's legal spouse. A cynic has said, "Teaching is the highest aspiration of the lower middle class." Perhaps law making and judging should be included in this statement.

As an historical aside, I venture that a century from now, sociologists will cite *Playboy* magazine as this generation's greatest single lever for producing toleration and compassion in the area of morals.

Any discussion of societal problems should contain at least a nod to the famous Generation Gap. The sexual revolution has been proclaimed but two of the most reliable surveys (37, 38) indicate little change in what young people are actually doing. The trend seems to be less promiscuous sex and more stable sexual liaisons, often leading to formal marriages. In such situations, it seems likely that more men will learn the location and usefulness of the clitoris, and that a non-legal union would not flourish long in the face of unskilled love making.

THE FAMILIAL LEVEL

The next level of our hierarchy is the familial. The scientific study of interaction within the family has had an enormous expansion during the last decade. Family structure studies traditionally were done on New Guinea natives, not New Jersey natives; now such pioneers as Don Jackson, Virginia Satir, Eric Berne and Jay Haley have changed all that. Every major American city has family therapy and family study institutes.

The complexity of an individual is complicated further when he or she participates in the prolonged and intimate interactions of a family. A family of five can form dozens of different combinations of alliances—just on one subject. The only thing that preserves the sanity of family therapists is that there are repetitive themes and patterns, as illustrated in *Games People Play*.

Families rarely would have occasion to discuss the clitoris as such, but parental reaction to the universal childhood impulse to masturbate may take many forms: horror, rage, disgust, neutrality or pleasure. An attractive, well-to-do and neurotic woman of my acquaintance spent her nights, when young, with her arms tied to the bed with silk ribbons. In many other ways, she had "every advantage," but the final outcome of her parents' life style was to leave the girl a mental cripple. Such a person's ambivalent feelings toward her genitals would certainly include the clitoris.

There must be a million methods of child-rearing, and every bookstore is full of contradictory advice. What is clear is that families can send their child strong messages about self-worth. If the message regarding wholesome self-love is negative, the resulting adult will be crippled in his or her ability to love, both with the spirit and with the body.

What families sometimes do that may be even more harmful than directly negative messages is the sending of "doublebind" messages, in which there are two simultaneous, mutually exclusive commands. This produces confusion, rage, self-doubt and perhaps even the behavior called schizophrenia. Therapists who work with whole families see this in action. Usually, one message is spoken, while the other, opposite message is conveyed by voice tone, facial expression or body posture. A simple example might be for the mother to say to her daughter, "But, Mary, you know we love you," while the mother's face and hand muscles betray a posture of hatred and rejection.

The traditional psychoanalytic focus in the study of early childhood is the Family Romance or oedipus complex. For girls, this concept may be formulated as follows: at roughly age three, there is an intensification of her wish to have exclusive possession of her mother, accompanied by an awakening awareness of male and female genitals and their possible uses. This change is seen partly as an increased rivalry with brothers and sisters, but operates especially in her relationship with father. The girl wishes to replace her father and be Daddy to her mother. When the girl realizes she does not have a penis, a realization which brings with it intense feelings of shame, inferiority and jealousy (penis envy), she is enraged at her mother for having permitted

her to be born without a penis. "In her rage and despair she normally turns to her father as her principle love object and hopes to take mother's place with him" (4). The normal outcome is for the little girl to be rebuffed by her father in her desire to be his sole sexual love, and to renounce and repress her oedipal wishes. Brenner emphasized, "the most important single fact to bear in mind about the oedipus complex is the strength and force of the feelings which are involved. It is a real love affair."

This highly compressed account of the oedipal relationship does not do justice to the enormous psychoanalytic literature on the subject. As in many areas of psychoanalytic theory, what previously was accepted as an article of faith is now open to real question as to accuracy, relevancy and universality. One of the technical problems of individual psychoanalysis is that there is no corrective reality process operating. In theory, the analyst is silent and neutral and the patient's free associations are completely spontaneous. The result should be aseptic, scientific and objective revelation of the patient's thinking. What seems clearer in the last decade is that psychoanalysts have been naive about the amount of suggestion that takes place. Respected investigators like K.M. Colby have begun to document the extent to which the analyst's expectations and theoretical constructs are conveyed to the patient. A remark, a yawn, a sigh, a shifting heavily in the chair—all these give constant "coaching," in which certain trends are reinforced and others are suppressed, very much like what behaviorists call operant conditioning.

When the whole family is present, the therapist (or therapists) is outnumbered. His interpretations are more likely to be challenged; the family interactions are seen "live" rather through the bias of the solitary patient's second-hand reporting. This suggests that the family therapist may have a better chance of seeing the family reality than the classical analyst. To go further, Whitaker (48) states that any therapist who sees only one spouse of a married pair is contributing directly to a divorce.

THE INTERPERSONAL LEVEL

This leads to the next two hierarchical levels: interpersonal and intrapersonal. They and the familial system are closely related. Except for children raised in orphanages, most people spend the first decade and a half of life learning attitudes and reactions from their family, responding with the nervous system they have inherited, and adding their own spontaneous ideas. No one factor seems clearly dominant; we are shaped on the anvil of heredity by the hammer of environment. When we leave our families, we usually establish a specially close tie with one or a few other adults: a roommate, a lover, a spouse, a psychiatrist. This is the hierarchical level I designate adult interpersonal, and it is here that I want to examine the current major controversies in sex research. It should be clear that the interpersonal level interacts with all the other seven levels of organization.

Scientific knowledge about sexual matters in America today is not a unified area, but is rather sharply divided into at least two camps, which I term the Reichian dialectic neo-Berkeleyists (RDN) and the physiologic viscographers (PV). The leading RDN's are Natalie Shainess, Leslie H. Farber and Alexander Lowen. The PV's are, of course, William Masters and Virginia Johnson. I tend to sympathize with the PV's. The two designations deserve some clarification.

Wilhelm Reich (born 1897) worked closely with Freud in the early days of the psychoanalytic movement, and was formally expelled from the International Psychoanalytic Association in 1934. His early work emphasized that mental attitudes and muscular tension were vitally interrelated; Reich believed that sexual inhibitions were not only the cause of personal misery but led people to inflict their misery on others in the form of political repression, inquisitions and the like. According to Reich there is a correct type of orgasm which comes only from intercourse and only occurs when the intercourse involves *involuntary* pelvic movements. Although I take exception to the insistence on only one correct type of orgasm, I think most of what has just been summarized is highly useful.

Reich's work after 1937 is less germane to this discussion,

since it centered around the concept of "orgone energy," which many scientists dismiss as the creation of a gradually deteriorating self-deluded crank.

Richard Rabkin has observed that Reich is an embarrassment to the orthodox Freudians since he represents the logical culmination of Freud's ideas on orgasm. (It is said that the saving grace of the English is that they never carry anything to its logical extreme; the Freudians may wish Reich had been English.) The relevant aspect of all this is that Freud and Reich and most of their followers believe religiously that as a woman matures, her sexual "leading zone" is "transferred" from the clitoris to the vagina; if the woman continues to need direct clitoral stimulation for orgasm, it is a sign of immaturity or neurotic illness. This idea sprang into Freud's head in 1910 without a visible shred of experimental evidence and it has probably caused more unnecessary worry than any other single psychological notion (9).

Now about the neo-Berkeleyism. George Berkeley became Bishop of Cloyne in 1734. In his several books on philosophy, the central ideas are that 1) all qualities are known only in the mind, 2) matter does not exist apart from its being perceived, and 3) the observing mind of God makes possible the apparent continued existence of material objects. As an example, if a tree falls in the forest and no one sees it fall, then the tree and its fall did not exist, except perhaps through and in the mind of God.

The relevance of the Berkeleyistic view is this: the critics of Masters and Johnson state that any person who would be a subject in such research is *a priori* abnormal, that the conditions themselves produce further bias, and therefore any conclusions from sex research which uses direct observation and actual measuring devices are invalid. The RDN's (41) claim that the only reliable information is from patients, who are describing second-hand, days or even years later, events which cannot be verified or recorded in any way!

Dialectic is the philosophical principle that things are, or will become, their own opposite. The dialectic neo-Berkeleyans believe in only that which has not been seen; any material evi-

dence is proof of error. (In contemporary psychology, this is also called *chutzpah*.) One can only admire the confidence of a group which claims as its strongest proof the fact that it has no direct observations.

Such a *tour de force* of Alice in Wonderland logic may be spoiled by repetition, but there is more to come. Shainess (39) says, "... I question whether an 'in vitro' laboratory simulation of coitus can bear any resemblance to the normal..." (the normal, presumably being determined by her own psychoanalytic research), yet one paragraph later she states, "... possibly because it is rare for a healthy woman who has mastered her life conditions to come into analysis, it is difficult to determine the normal or healthy libidinal drive..." Since she begins by stating that her method is the correct one and then adds that it is hopelessly biased, we may be seeing here an example of *meta-chutzpah*.

Alexander Lowen (22), a long-time pupil of Reich, writes, after having used 192 pages defining a correct orgasm, "No one but the individual involved can state definitely whether or not he or she has experienced an orgasm in the sexual act." This, of course, raises the question of how the analyst can tell the patient that his or her orgasms are not correct ones. The communication problems thicken as Lowen continues, "Contact and friction alone, such as when the penis is masturbated or brought orally to climax, can produce ejaculations but never orgasm." It is clear that Lowen redefines orgasm to fit his theory.

As a final note before discussing the physiologic viscographers, I would like to indict the RDN's on charges of Chronological Primitivism, the belief that in some bygone Golden Age, people and societies were more natural and healthy, but through recent corruption have become degenerate and effete. Jean Jacques Rousseau was fond of this notion. Chronological Primitivism is clearly in evidence when Shainess says, "Sexual inadequacy in either sex is a sign of our times, and related to manifold other aspects of our lives. We cannot turn back the clock. But we can search for what was meaningful in the past..." (40).

The objects of all this RDN excitement are the chief and

almost only physiologic viscographers, William Masters and Virginia Johnson (26, 27). Physiological of course, because they have actually been measuring real, live human beings having real, live sexual behavior. Viscographers because they publish their findings in a literary style which is thick, adhesive and nearly unreadable. (*Viscum* means "bird lime," a sticky substance smeared on branches to capture small birds.) The RDN's have rightly criticized the Masters and Johnson writing style—but for the wrong reasons.

The spoken conversation of both William Masters and Virginia Johnson is totally lucid; it is very clear that they rewrote *Human Sexual Response* so it could not possibly be interpreted as pornography. Established investigators should ignore such possible charges and say their say. The treatment of couples by couples is sound therapy. Their verified results are better than anyone else's thus far. Their marriage-saving work needs the support of clear expository prose.

These polemics of doctrine are a prelude to the main theme of this chapter: the clitoris and its role in interpersonal sexuality. First of all, style is everything.

Mating is not random. Except for forcible rape (and even that may sometimes be an exception) we *choose* our partners. Obviously, the real world sets limitations. An Irish secretary in Manhattan is not likely to find herself in bed with an Australian aborigine. Geography, race, language, and social class are the first selective determinants. The next step in the sorting process is choosing among partners who are available. This is still a field of vast complexity—masochists may seek sadists, hysterics may seek paranoids, rescuers may seek alcoholics. Hopefully, most matchings are healthier and less overdetermined. In time, nearly everyone finds a companion who comes close to the ideal mate. If the individual seeks someone like mother or father, this introduces another level of complexity, depending on the intensity of the need and what the parent was like. Since only the individual can know his or her own body's exact preferences, the perfect sexual partner exists only in masturbation fantasies.

The possible interpersonal combinations are endless, and the following aphoristic observations are highly selected. All couples

who are married have grounds for divorce. Moods change from day to day. One of the few helpful marriage guides for men occupies just five pages of Peg Bracken's book, *I Try to Behave Myself*. The spouse who calls out some other partner's name at the height of passion will have a lot of trouble—soon. Male overreaction to a woman's occasional coldness may be because he knows: 1) she is basically capable of many more orgasms than he is, and 2) as they both age, her superiority will be accentuated. While it is more common for a man to leave his wife for a younger woman than vice-versa, this would be reversed if women's taste in men were as indiscriminate as men's taste in women. Enough aphorisms.

Interpersonal psychology includes cooperation (or lack of it) in the physical act of sex. Both technique and good will are necessary. The sex technique advice in many marriage manuals usually contains at least three harmful recommendations. The first is for the man to find and rub the clitoris with his finger. The flexible anatomy of the clitoris means it will usually escape the searching digit and if the man is successful, his dry, calloused finger will quickly make the clitoris raw. The second piece of advice is to "ride high" during intercourse, so that the upper surface of the penis rubs the clitoris. The man who conscientiously follows this dictum will give his wife cystitis (from crushing the urethra) and rectal pain (from the angle of their union); just before orgasm the clitoris retracts so the whole maneuver becomes impossible anyway. The third helpful hint is that a woman is mature only when her orgasms come totally from vaginal stimulation. The worry from this idea, compounded by the pain from the first two techniques is enough to impair any marriage.

The soundest advice in interpersonal affairs is Richard Condon's—respect is the best aphrodisiac. Couples who give and merit mutual respect will find their path broad and well lighted. The alternative seems best illustrated by Alexander Portnoy—the solitary Don Juan.

THE INTRAPERSONAL LEVEL

The sixth level of the hierarchy is the intrapersonal—the realm of inner life, personal thoughts and communication with self, dreams and reverie. The intrusion of others keeps the intrapersonal and the interpersonal in frequent contact.

A starting point for the study of the intrapersonal is the observation that the human mind is constantly generating unwilled, unintended images, sounds, smells and other sensory perceptions that have no visible personal meaning (21); an analogy might be the letters that bubble to the top of a kettle of alphabet soup. They have no pattern or meaning. They are no more a communication than the hum of an electric typewriter without its typist. All the content is latent, formless; only the superimposition of the owner's volition can add meaning. The process of conscious thinking is constantly influenced by these random sensory eruptions.

Probably related are the subliminal sensations found by a team of San Francisco neurosurgeons (20). They discovered that small, brief experiences, either through sight or touch, may come into the conscious mind only after a delay or even not at all, but the arrival of the experience at the cortex can be determined immediately by an averaging computer, which can detect what is usually invisible in the jumble of other brain events. Other research (5) has shown that brain cells are spontaneously and unpredictably active, and that only average figures can be found for how much or when any network of brain cells will fire. The basic housekeeping areas of the brain (e.g., respiration centers) have more predictable patterns of activity, but these too are only statistically predictable, rather than being known at any particular moment.

Thus the spontaneous generation of images, the unpredictable spontaneous activity of neurons, and the unconscious reception of consciously unperceived events all create a continuing and powerful background to the visible events of intentional thought.

These events of course have implications which could expand this inquiry to impossible proportions. Clearly daydreams, ran-

dom ideas, marginal thoughts, the sudden visions associated with falling asleep and awakening, dreams themselves and the ability to meditate are interrelated. Some people invite such changed perceptions by fasting, prayer, prolonged wakefulness, meditation and psychedelic drugs. Others are terrified by any extraordinary mental experience. This can cause a sexual problem since, if the letting go of inhibitions and self-consciousness, so necessary to orgasm, is perceived as a personal disintegration, then orgasm becomes akin to death and dissolution. A common expression for the brief change in consciousness at orgasm is the French term *petit mort* ("little death"). Most of us are willing to risk many such little deaths since we feel sure of our immediate rebirth. For some, the same sensations conjure up terrors of separation, actual death, dismemberment and bizarre transfigurations (13, 14). Again, some people welcome intense distortions of sexual time and space and enhance them with marijuana, LSD or amyl nitrite, which can make orgasm truly awesome.

A phenomenon which may link several of these elements is the perception, while falling asleep, of a "something" touching the face, mouth and hands (10). A likely explanation is that this is a memory, from preverbal infantile experience, of falling asleep at the breast. The little that is known of the thinking of infants suggests that they are quite unclear about what is them and what is the outside world. This same disturbance in boundaries is seen in dreams and the perceptual changes of intense sexual experiences, which the healthy person can accept.

One of the problems of American intrapersonal psychology is that so much of it is Freudian, either stated by Freud himself or a follower. Almost all American psychiatry is either Freudian or a reaction against Freud; he has become the point of reference. However, the last twenty years have seen a mass of new material unearthed regarding Freud's personal blind spots, not the least of which was his lack of understanding of women. It is no detraction to Freud's courage, strength and creativity to examine the extent to which his thought was influenced by being a puritanical, middle-class Jew in Vienna in the late 1800's. That plus his own personal and family style make it preposterous to ascribe to him a super-human objectivity. There may be theologi-

cal logic in Christ's being his own Father, but for Freud to have been the only analyst to have analyzed himself (he refused Jung's offer) is a bit more than even his admirers care to swallow.

His visible bias shows in many scientific articles and personal letters in which he clearly sees women as defective, inferior and incomplete. Wheelwright (47) has tried to nudge the Freudians away from such notions as penis envy by his offering of the breast envy concept to explain male problems, but to no avail. One of California's leading Freudian psychoanalysts (49) told me, "It isn't a matter of bias, the female genitals *are* ugly."

The many theories of personality (i.e., intrapersonal psychology) in western culture alone form such a tangled thicket that any attempt to relate them all to female sexuality would easily fill an encyclopedia. The followers of Jung, Freud, Rank, Adler, Reich, Sheldon, Lewin, Eysenck, Pavlov, Murray, Allport, Berne, Skinner, Rogers, Murphy, Mead, Fromm, Horney and Sullivan would all be insulted if their approach were to be improperly presented. I will leave this task to someone else and only summarize what seem to be crucial points, based mainly on observational research, not speculation.

The ability of a woman to have an orgasm can be independent of any partner and can be considered as an *intrapersonal* experience. Not only is a partner unnecessary (though desirable) but even pelvic physical stimulation is unnecessary. Forty per cent of all women have had dreams which produce orgasm (15). Masters and Johnson have several subjects who can produce orgasm by deliberate fantasy. I knew a woman who had an orgasm on learning of a job promotion; others are capable of orgasm during times of intense excitement, such as having their political candidate win. There are several reports of orgasm associated with nipple stimulation or viewing works of art.

The converse is equally true. There are numerous times when even with strong physical stimulation an orgasm is impossible, a clear illustration of the inseparable nature of mind and body. In a remarkable essay (18) on the psychology of women, an anonymous woman novelist illustrates how men write of sex in an exaggerated and fantastic way, while women are more realistic, and emphasize the mental, not the physical side. In one passage,

the heroine was abandoned by her lover, but later reunited with him. She finds that she cannot respond: "Now this tiny grain of doubt arrested her orgasm. She lay back weary from desire and caresses, but without the fulfillment. Pierre bent over her and said in a gentle voice, 'I deserve this. You are hiding away, even though you want to meet me. I may have lost you forever' . . . 'No, not forever,' said Elena. 'Wait. Give me time to believe in you again.'"

How different this dialogue is from the aggressive angular, external prose of most male novelists (and scientists). The woman's touch is more with the reasons, not the actions.

There have been various attempts to quantify and study who has orgasm and who does not, and why. Terman (46) studied 556 wives who were part of his group of persons with I.Q.s in the gifted range. He categorized their orgasm adequacy on the basis of the question: "In sexual intercourse, do you experience an orgasm always or usually (387 wives), or sometimes or never (169 wives.)" He then asked dozens of questions of both groups and compared the answers, with some surprising results. The group who had orgasms "seldom or never" seemed as happy in most aspects of marriage as the other group. There were no significant differences between the groups in their reaction to losing their virginity. Also perhaps surprising is that the time duration of each act of intercourse was about the same for both groups, tending to eliminate the husband's rapidity as a cause. Thirty-two different questions about childhood experiences yielded only one item which distinguished the two groups of wives—the question of early sex education by parents: the more education, the more orgasm. There were no findings which would confirm an oedipal hypothesis. One of the few definite conclusions was that the husbands of the orgasmically inadequate wives had had "exceedingly strict" childhood discipline. The husbands of the adequate wives tended to be more cheerful and sociable. There were no differences in divorce rate for the two groups. In general, the wife's "personality" was the single most important variable. The wives with less orgasm described themselves as oversensitive, grouchy, regretful, prone to ask advice and unsure of themselves.

Gebhard (8) analyzed the answers of 1,026 women and found

a greater connection between marital happiness and orgasm. Of women whose coites ended in orgasm more than 90 per cent of the time, 59 per cent described their marriages as very happy. Interestingly, 38 per cent of the women with "very unhappy" marriages also reached orgasm in more than 90 per cent of coital experiences. Clearly, happiness is not everything. Gebhard also found a clear positive correlation between the length of foreplay and achieving orgasm: longer foreplay, more orgasm. The correlation between duration of intercourse and frequency of orgasm is also positive but more complex: "In brief, 16 minutes of intromission suffices to bring essentially all women to the limits of their orgasmic capacities."

A Pennsylvania State University investigator (43) studied 80 unmarried college girls, 40 of whom usually experience orgasm with coitus and 40 who had never had a coital orgasm, even though they had a similar amount of coital experience. He found several features characteristic of the girls who were orgasmic: they controlled their movements during coitus until near orgasm when they lost (or relinquished) control; they felt about the same degree of interest in sex as did their partners; they "faked" orgasms more than the girls who never had orgasms; and they were less stable in temperament. The non-orgasmic girls exerted much conscious control over both internal and external pelvic movements. This would tend to confirm Reich's ideas about the necessity of giving up voluntary control during parts of successful coitus.

Two New York researchers (7) examined and interviewed extensively 42 female volunteer subjects under the age of 45. The findings indicated that paper-and-pencil personality test results, age of marriage and previous dating behavior had little correlation with current sexual responsiveness. They did find strong evidence that ability to tolerate and enjoy intense sexual feelings was connected with successful sexual response, which confirms the importance of not being afraid to "let go." Another finding was that a general enjoyment of life pleasures, including good food, was a strong predictor of sexual happiness. A feature of special interest was a seven-possibility questionnaire, whose first question was: "In your attaining orgasm, does clitoral stimula-

tion contribute much more than vaginal stimulation." The other six questions were different shades of emphasis ending with a question in which vaginal stimulation was dominant. The usual response was that the clitoris and vagina were of equal importance, and, further, there were no clear correlations between clitoral-vaginal preferences and any other variables. The team concluded, "Such data . . . forcefully put the burden of proof upon those who wish to maintain that the clitoral-vaginal distinction reflects important aspects of the organization of the female personality."

Marmor (24) was one of the first Freudians to raise the heretical notion that Freud did not know much about women and their orgasms. Marmor suggested a theoretical neurological model: female orgasm is a spinal cord reflex, set off by various pudendal stimuli. If the cerebral cortex inhibits the reflex, high degrees of stimuli to that most sensitive area (clitoris) are necessary to "fire" the reflex; if the cortical influence is weak inhibition or facilitation, then more diffuse stimuli (vaginal stretching, indirect clitoral stimulation) can cause orgasm.

A somewhat different approach to sexual classification is that of Meyers (32, 33), whose ideas resemble Reich's. Meyers bases his classification on whether the woman does or does not swing her hips when she walks. Those women who swing their hips are "clitorids," those who do not are "uterines." The clitorid has a knack with clothes; she lives for her man, for "la grande affaire." Her search for the perfect partner is often unsuccessful; the result is headaches, misunderstanding, depression, pelvic congestion and non-infective discharges. If these speculations could be verified, the results would be highly useful in understanding marriages.

Stoller (44), who has devoted his career to clarifying the interrelationship of sex (possession of ovaries, testes or neither) and gender (the conviction that one is a man or a woman), gently takes Freud to task for his misogyny and unverified belief in male superiority. Most evidence indicates that the core gender identity of a woman ("I am a female") is the simple acceptance of body ego, which develops regardless of chromosomal state or genital anatomy, as long as the parents of the subject had no

doubt that their child is a girl. Stoller remarks, somewhat sharply, "If Freud had treated a woman without a vagina, I think he would have seen that the only thing a woman wants more than a penis is a vagina."

Thus the intra-personal level of organization includes self-image as a person and as a woman, the spontaneous flow of thoughts, the ability to accept strong sensations and the projections of self in gait and posture.

THE ANATOMICAL LEVEL

The seventh level of our hierarchy is the anatomic, with emphasis on the nerves, muscles and blood vessels which make sexual functioning possible.

The fundamental anatomy of female orgasm is hydraulic: the pelvic, vulvar and clitoral veins and capillaries become engorged with blood; edema fluid accumulates in the pelvic tissues; full engorgement of the vestibular bulbs is associated with the onset of about ten muscle contractions (orgasm) which empty most of the extra blood and fluid from the pelvis. This progression of events is summarized in the now-famous Masters and Johnson four phase sexual cycle: excitement, plateau, orgasm and resolution.

Many stimuli can produce this cycle of events: fantasy, breast stimulation, rectal stimulation, direct clitoral-mons stimulation and intravaginal intercourse; the latter two are by far the most common. The resulting orgasms appear to be anatomically identical; the presently-used terminology, e.g., vaginal orgasm, creates confusion, and such terms as *vaginally-induced orgasm* would specify the regions or mode of maximum stimulation, without introducing any claim of further understanding the mechanism. The following discussion of the functional anatomy of female orgasm induction presupposes several conditions: the topic is not the vehicle for selling some undocumented personal, political or professional viewpoint; the hypothetical woman under discussion likes sex, is not resisting an orgasm, and respects herself and her sexual partner; and further, her sensory input includes strong stimulation of the pelvic organs.

The clitoris is the outermost sexual receptor. The glans of the clitoris, visible as a button of tissue about one-third of an inch across, is located above the vagina, where the labia minora join. Only ten per cent of the clitoral structure is visible. The other ninety per cent, equally important, lies like the two prongs of a wishbone along the rami of the pubic bone. The glans and the labia minora both contain enormous numbers of receptor cells, whose sole function seems to be that of receiving pleasurable stimuli. The entrance to the vagina is almost entirely surrounded by the vestibular bulbs, a pair of blood vessel bundles, which connect with the network of veins surrounding the rest of the vagina. All these vessels serve as erectile tissue, contributing to the narrowing and lengthening of the lower one-third of the vagina seen during the plateau phase. The walls of the vagina produce a clear fluid during sexual excitement, which lubricates the area and makes penile movement easy and painless. The lining of the vagina has few nerve cells, but this does not mean there is anesthesia, since the pubococcygeus muscle, which surrounds and attaches to the vagina, contains proprioceptive or stretch-receptor cells. These (or some other pleasure receptors) are concentrated in two grooves which can be described as located at four and eight o'clock, if the vagina, seen from below is divided like a clock face. If the pubococcygeus is strong and healthy, which is true in only about twenty per cent of women, these receptor nerves can respond to touch, either penile or digital, with clearly sexual-pleasurable sensations. The strength of the muscle and the location of the sensitive areas can be found within seconds by physical examination. Women whose pubococcygeus muscle is weak and thin can be taught to exercise the muscle (12) and will notice an improvement in coital sexual perception in less than a month. More than sixty per cent of women with coital dissatisfaction can be greatly helped by this simple method.

Some women notice that the pubococcygeus sexual receptors are more sensitive on one side than another, and jokingly refer to this as having left-handed or right-handed orgasms. Contraceptive diaphragms spread these structures laterally and make vaginally-induced orgasm more difficult, according to the late Arnold Kegel.

Some recent research has suggested that the evidence for vaginal wall insensitivity may be challenged. Some mammals have been found to have free nerve endings emerging from genital corpuscles in the vaginal wall (16). An unresolved controversy in this subject is the clear disagreement between Kegel and the Masters-Johnson group. Masters states (28) that in itself the pubococcygeus has nothing to do with sexuality, and that training of this muscle is of benefit only for minor degrees of urinary incontinence; "...under direct observation, the pubococcygeus has been observed to relax during late plateau and orgasm, allowing the mid-cervical diameter of the vagina to increase." Masters, however, seems to misunderstand Kegel, who does not say that the pubococcygeus contracts during orgasm, only that strengthening the pubococcygeus changes many neural, vascular, and muscular aspects of the total pelvis, with increased sensory perception-awareness (sensate focus) and increased ability to achieve orgasm during intercourse.

The other data suggest, teleologically, that the pelvic organs "want" or "like" to have internally-induced orgasms; in women born with no vagina, an artificial vagina can be constructed, where one should have been, and a woman can have normal intercourse. Further, the lining of her new canal begins to produce the transudate fluid of a natural vagina, and within a few months she is able to have vaginally-induced orgasms. A further example of a "cooperative" pelvis is seen in the recta of persons who practice anal intercourse. There is strong hypertrophy of the hemorrhoidal vein network, which responds to arousal with vasodilation and flow of transudate into the rectum. The muscles around the rectum act like vaginal muscles, producing strong, multiple orgasms.

The same pelvic muscles may cause pain as well as pleasure. Paradis (35) reports 92 cases of patients who appeared with complaints of rectal pain. On examination the tender, painful area is not the rectum but the tendinous arc of the ileococcygeus muscle, especially adjacent to the ischial spine. The patients had poor pelvic muscle tone and habitually sat in slumped positions, which probably caused the muscle strain and spasm. Strong digital stretching of the attachments of the coccygeus muscles cured most of the patients.

Male-female coitus certainly stimulates more than the vagina and pubococcygeus muscle. Masters and Johnson (27) have shown that the clitoris is stimulated, not by direct rubbing on the penis, but through an indirect route. When unaroused, the clitoral shaft points straight down or even slightly to the rear; during stimulation it moves almost 180 degrees, rising up and, just before orgasm, retreating back under the prepuce, drawn by contraction of the ischiocavernosus muscles. Each penile thrust is transmitted by the arch of tissues that goes from one side of the vagina up to the prepuce and down to the other side of the vagina and results in an intermittent pulling down of the prepuce, which slides over the clitoris, leading to strong stimulation and contributing to an important clitoral component in most vaginally-induced orgasms.

Another important area is the lower or outer one-third of the vagina. This area becomes elongated and swollen, forming what Masters and Johnson call the "orgasmic platform." The muscles of the pelvis, the swollen part of the vagina, and the rhythmically stimulated clitoris form together a unit which is all influenced by coitus. Although at a particular time, with a particular woman, one area of stimulation may be especially important, it seems clear that coitus contributes potentially pleasurable stimuli to all of the pelvic organs.

Direct stimulation of the clitoris (including mons traction, tongue friction (19) and vibrators) will produce orgasms with more reliability than other modes of stimulation. The perceptions travel from the many receptor organs of the glans and crura along the dorsal nerve of the clitoris to where it joins the pudendal nerve, which is formed from the anterior rami of the first, second and third sacral nerves. The exact nature of how the spinal cord and brain facilitate or inhibit response to these stimuli is unknown, but local electrical brain stimulation (29) has shown that many portions of the limbic lobe control clitoral enlargement, and that these are the same neurological structures which can produce penile erection.*

*A recent addition to the field of orgasmic neurophysiology is Heath's discovery that orgasm is accompanied by spike and slow waves in the septal "pleasure centers," deep in the brain: Heath RG: Pleasure and brain activity in man. *J Nerv Ment Dis* 154: 3-18, 1972.

Stimulation of only one of the two principal areas (i.e., clitoral and pelvic) can produce orgasm. Women whose clitorides have been removed can still have orgasms, vaginally induced; direct clitoral stimulation, with no vaginal pressure can also produce orgasm. Thus neither clitoris nor vagina by itself seems essential to orgasm. There do seem to be some differences between clitorally-induced and vaginally-induced orgasms, beyond the anxiety produced by theories of clitoral "immaturity." Some of the differences can be measured: contractions of the uterus and the rectum are stronger, and more multiple orgasms are possible, with clitorally-induced climax. The woman's perceptions of the various "types" or orgasm are hard to convey, first because we lack suitable vocabularies for most bodily functions, and, secondly, because female sexual response can range along a wide spectrum of thematic variations, all of which defy simple naming or classification. With this *caveat*, women who have experienced orgasm from both types of stimulation can often distinguish a difference, and tend to refer to vaginally-induced orgasm as less intensely focused and somehow more satisfyingly deeper. They sometimes add that they feel more "womanly." Most likely this difference in sensation seen with some vaginally-induced orgasms is because there is stimulation of the nerves of all the previously mentioned areas. Anthony (1) writes of her additional pleasure when receiving anal stimulation, along with the just mentioned ones.

Each couple is different, too, in their anatomic matching. The angles of pelvic approach, the penis and vagina ratios and the distribution of pelvic receptor nerves all differ. This important consideration is charmingly described by C. M. Chen, the Buddhist yogi of Kalimpong, who describes his connections with a Dakini (a woman who assists a man in Tantric meditation) and with his wife:

I have found out the secret purpose was not merely for play in various ways but for finding the secret nerve inside the lotus through many different attitudes, till a certain situation of secret nerve of the certain Dakini is found. In Buddhism Tantra of vajra love, it has been taught by gurus that each Dakini has its secret nerve in her vagina but their situations are different from one

another unless and until, through many kinds of coitus in many different postures, one cannot find out this secret nerve. In Dakini A. vagina, her secret nerve may situated on east side but in Dakini B. it may situate otherwise. When the secret nerve has been touched by the male and has directly insert into the urethra, both medeum nerve were interlinked then the great pleasure of the female might get a sooner ejaculation much more fast than acting on other postures which may not able to touch the secret nerve. Once I was permitted by my Guru Kunjar Rimpoche to practice vadra love with the pure land Dakini Miss Kuncho. First I had tried with many other kinds of Coituc attitude, her secret nerve has not been touched and her ejaculation was very slowly. Afterward I used the posture like vajrasattva and his consort, i.e., both set face to face her secret nerve was immediately touched, her ejaculation happened very quickly. She could not but lie her head on my shoulder. A great pleasure in her body made her soft and could not sit straightly. She closed her eyes and felt very delightful. But when I practiced with my wife her secret nerve could be touched only by playing in the attitude of Paravittaka. As this attitude was not sitting so she was like the bitch who rolled her body on the ground with much pleasure. I never changed the posture since her secret nerve was found out. So was she desired. (6)

The question of multiple orgasms is also part of the RDN versus PV controversy. When Kinsey published his book on women (15), he was denounced by many critics, including Drs. Bergler and Kroger, psychoanalyst and gynecologist respectively, who described as "...fantastic tales..." the descriptions of multiple orgasm given to Kinsey by his female informants. These two critics can be forgiven, for that was years ago, and they labored under the double handicap of being both male and Freudian. What is harder to understand is that a woman physician (39) continues to maintain today that multiple orgasm not only doesn't exist but is actually a type of frigidity! The experience of millions of women and the repeatedly documented Masters and Johnson work do not seem to influence those determined to disbelieve.

The clitoris vs. vagina controversy has yet another facet: some unexpected support of the "transference" idea comes from a non-Freudian, Dr. Arnold Kegell, the gynecologist who made the

pubococcygeus famous. He believes that pubococcygeus weakness is related to human upright posture. Gravity works against the pelvis and what falls forward (up) in quadrupeds, falls downward in us. Upright posture is so recent a development that the species has not evolved a naturally reliable mechanism. This is apparent in many young girls with lax pubococcygii and consequent loss of urine when standing up. Before this is corrected by pubococcygeus exercises, they guard themselves by using their external muscles and keeping their legs tight together. With chronological maturity and/or training the girl transfers sphincter control to deep muscles. In contrast with Freudian transfer, which involves hypothetical substances such as cathexis and libido, Kegelian transfer is purely mechanical, which leads to simplicity, not only in explanation, but also in treatment. Kegel observes that transfer of bladder control to deeper muscles also produces the transfer of perception of sexual sensations.

A further note on orgasm involves orgasm as therapy. This has been apparent to most people for millenia, from personal experience. Now, the physical benefits can be made clearer. In 1949, Dr. Howard C. Taylor, Jr., a leading gynecologist, published research showing that chronic unsatisfied sexual arousal produced pelvic congestion and fibrosis. The treatment is clear: relief must follow arousal. Dr. W. Edward Naugler, a San Francisco rheumatologist, has observed a syndrome of knee and thigh pain, with mental depression. It is seen in middle-aged women, who are single or widowed, and seems anatomically caused by tension in the gracilis muscle, which extends downward from the clitoris area. All cases have been relieved by masturbation. Many women have discovered that masturbation relieves menstrual cramps. This folk knowledge is confirmed by Masters and Johnson, who suggest that since pelvic congestion is like the edema of menstrual congestion and water-retention, the same treatment (orgasm) should be good for both. Clearly, there are many situations where to refrain from orgasm is a deliberate decision to produce ill health.

The anatomy of orgasm and the clitoris would seem far removed from politics, yet here too there is serious debate. Thirty years ago, Wilhelm Reich denounced the fascists (and his per-

sonal enemies) as sexually inadequate. Reich believed that lack of fully-satisfying, vaginally-induced orgasms led to a state of rage and frustration, which caused the brutal behavior seen in dictatorship. His followers, especially in New York City, are still of the same opinion. Diametrically opposed is Anne Koedt, a radical feminist, who has written a pamphlet, *The Myth of The Vaginal Orgasm*, in which she states that vaginal intercourse is not satisfying to women and is part of a male plot to weaken and control women. She advocates clitoral satisfaction as the way to be free of men. Apparently her views are a bit much for some of her colleagues and another feminist, Nancy Mann, has written a counter-pamphlet, *Fucked-Up in America*, in which she concludes, "I'm sure it's no coincidence that so many people in this country have bad sex. It goes along with the general disregard for human pleasures in favor of the logic of making a profit... but for women to blame it all on men (or men to blame it onto women) is bad politics."

A further complication in judging the anatomic role of the clitoris is that not all clitorides are the same; just as all other organs and metabolisms have strong differences, so, too, with the clitoris. Under the microscope (17) the mons veneris, the labia majora, and the labia minora, as well as the clitoris, can be seen to contain large numbers of specialized nerve endings, which mediate and "report" the sensations of touch, deep pressure, engorgement and sexual stimulation. While it is common to find these endings concentrated in the clitoris, many individuals have a greater concentration in the labia minora or elsewhere and very few endings in the clitoris. There well may be an anatomical, as well as an experiential basis, for the different patterns of sensitivity and response seen in different individuals.

The functional anatomy of the clitoris might be summarized by saying: Its sole use is pleasure; such use brings health and happiness; and it's not the only route to an orgasm.

THE ELECTROCHEMICAL LEVEL

The eighth organizational level at which the clitoris can be described is the electrochemical. Aspects of this are described in the chapters on neurophysiology and histology. The complexities of physiology necessitate oversimplification and division into arbitrary compartments. Most of the body contains receptor nerves which receive and report stimuli. The receptors may be in the skin or in the deeper structures; they are the terminations of nerves which run centrally, ending finally in the brain and/or spinal cord. Some of the receptors, under the microscope, appear as bare, free nerve endings, while others have distinct shapes; the latter seem to receive specific types of stimuli. Touch, cold, warmth, and deep pressure are perceived and reported by different-appearing microscopic structures; the receptors for pain are nerve endings without the distinctive shapes seen in the other receptors.

The sensory nerves run centrally and have their main cell bodies in the spinal ganglia, which lie lateral to the spinal cord. The nerves terminate in the cord in connections with other nerves; these in turn go in many directions and serve many functions.

Each nerve is itself a complex system. When at rest, the inside of the nerve has a high concentration of potassium and a negative electric charge, with a potential of about 80/1000 of a volt. The exterior of the nerve has a high concentration of sodium and a positive electric charge. When a receptor is stimulated, in some way it begins a depolarization of the nerve fiber membrane. In a fraction of a second, the potassium and sodium begin to exchange locations, and the electric charges reverse. This charge passes as a wave up the nerve, at about 200 mph until the nerve reaches its termination in the spinal cord. Other aspects of the nerve in action are a doubling of the oxygen uptake, and an increase in heat, all related to the utilization of sugar, promoted by the high energy compound, adenosine triphosphate.

When the impulse reaches the termination of the nerve, another system conveys the impulse across the synaptic gap to the

next nerve. At the tip of the first nerve are tiny "packets" of acetylcholine, which begin to diffuse across the cleft between the two nerves. Six hundred millionths of a second later the acetylcholine reaches the far shore, attaches to receptor sites and depolarizes the second nerve, which begins the movement of the impulse up that second nerve.

In the brain alone, there are about ten billion nerve cells with millions more in the rest of the body. All of them are busy receiving and sending messages many times a second. What saves the system from incredible chaos is the presence of synchronizing and coordinating systems. One of these is revealed by the brain waves seen with the electroencephalograph (EEG). Ten times a second, a wave of electrical activity commences at the back of the brain and sweeps forward, fading away as it reaches the frontal area, above the eyes. Many influences can create variations from this pattern: sleep, age, alertness, epilepsy, brain injury, low blood sugar and insufficient oxygen. The latter can be related to sexual excitement in the following way: passion is associated with heavy breathing; heavy breathing removes some of the body's natural carbon dioxide; this chemical change causes the cerebral arterioles to constrict, which reduces cerebral blood flow, which reduces the amount of oxygen and sugar reaching the brain cells. The resulting "starvation" is reflected in the brain waves, which change from a 10 cycle per second, medium voltage pattern (alpha waves) to a 3 cycle per second, irregular high voltage wave (23). The subjective change is one of being dizzy, disoriented, and mentally far away. These may have been the changes observed by a pair of Argentinian researchers (34) whose subjects masturbated while wired to an electroencephalograph. At orgasm, there were high voltage, three cycle per second waves. Masters and Johnson ran EEGs in their early studies, found mostly muscle movement artifact, and pursued the cerebral aspects of orgasm no further (11). The brain waves have taken on a new significance in philosophy as well as medicine, since it now seems clear that religious meditation involves training oneself to have long periods of alpha waves and little of the other frequencies (45). Tantric Yoga and Karezza both urge their followers to practice prolonged coitus, without ejaculation,

while maintaining a spiritual outlook. Perhaps this can be interpreted numerically as, "Where three-per-second was, there shall ten-per-second be." There are inexpensive (ca. \$150) devices on the market, which will tell the wearer when he is producing alpha waves. In the sexual realm, alpha training may do, centrally, what the Masters and Johnson squeeze technique does, peripherally, in the treatment of premature ejaculation. Research should be done to see if alpha waves and orgasm can co-exist.

Chemistry and electricity are inseparable in the body, as they are elsewhere. The brain waves are changed by thought, by light and by overbreathing. The menstrual cycle, with its influence on sodium and water metabolism, produces changes which range from insignificant to profound. One woman with pre-menstrual tension snapped at me, "Doctor, my brain is soggy!" A Michigan psychologist (2) studied twenty-six college girls and found that at ovulation the dominant trends were self-confidence, satisfaction and optimism. The same girls, two weeks later, were obsessed with themes of death, mutilation, hostility and anxiety. The same fluid accumulation which seems to encourage gloomy thoughts in the brain tends to increase sexual responsiveness in the pelvis, since most women seem to be most receptive in the days preceding menstruation. Clearly, the clitoris, and the nervous system it is attached to, are constantly influenced by a symphony of strong and sometimes contradictory electrochemical variations.

THE MULTILEVEL PERSON

Each person exists at all eight hierarchical levels simultaneously. The strength, health and inclination of the factors at each level vary with time. The summation effect of these various factors may become clearer by two extreme examples.

In a small Irish village (31), the cosmos (as represented by the church), the society, the family and the interpersonal encounters are all so violently anti-sexual that most women are not aware that they have a clitoris and have no experience with its function. As a member of a species and as anatomical electrochemical entities, they function, but these factors are not enough to

save them. (At least one psychologist accuses the observer, Messenger, of bias.) By contrast, on the Polynesian island of Mangaia (25) all life revolves around sex. No male-female social encounter ends without copulation. All adults are expected to know a full range of coital and mouth-genital routes to climax. All women expect multiple orgasms from every encounter and will not keep a lover who fails them in this. At every one of the eight levels, a woman and her clitoris are expected to be a happy combination, and usually oblige.

Current American life falls between Ireland and Polynesia. Most of us are neither as repressed as the Irish peasant, nor as totally committed to sexual life as the Polynesians. In brief, the level of sexual (especially clitoral) responsiveness of a woman depends both upon her training and upon her innate strengths in the realms of the spiritual meaning of sexual contacts; the orgasm ability that she shares with all members of the species; the sexual expectations of her societal group; the particular variations of those teachings as conveyed by her own family; the skill and personality of her sexual partner; her own internal fantasies and belief about herself; the distribution, number and locations of her anatomical nerve endings and pelvic muscle structures, and the moment-to-moment balance of her various hormones, electrolytes and other chemicals.

E.M. Forster remarked, "The perfectly adjusted organism would remain silent." And so, persons in harmony with themselves do not experience these eight levels as discrete experiences and spend little time thinking about themselves or their internal workings. They respond without reflection, joyfully and fully.

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PERSPECTIVES ON ANORGASMIA: TOWARD A FEMALE PHENOMENOLOGY

Thea Snyder Lowry

Although sexual functioning is perfectly natural, it is seldom naturally perfect. Orgasm is the appropriate goal in sexual activity for both sexes, yet perhaps fifteen percent of adult American women have never experienced a climax from any form of stimulation (1,2) and perhaps half of all married women do not achieve orgasm in coitus reliably with their partners (3,4). Has it always been this way?

The sexuality of our primitive ancestors has been debated at length. For the human race to survive, obviously, males must ejaculate within the female's vagina to ensure conception, but orgasm for the female is not a biological necessity. Elkan (5) has inferred from this fact that females are evolutionary late-comers in achieving sexual climax, but Sherfey (6) contends that prehistoric females were frequently and readily orgasmic. Unfortunately for the theorists, the tens of thousands of Paleolithic (35,000 B.C.—10,000 B.C.) European cave paintings do not contain a single image of copulation, either human or animal (7).

Perhaps instead species survival depended on a middle range of sexual interest for both males and females. If both parents decamped in search of new sexual partners, their offspring could not survive infancy; if mutual sexual interest were entirely absent, few replacements would be conceived. A female who became sexually involved enough to attract a mate who would protect her when she was most vulnerable would be more able to raise children than either the female who chose to abdicate her caretaker functions in the quest for sexual stimuli or the one who constantly rejected the attentions of males.

Of course, sexual availability is not the same thing as orgasm, but pleasure leading to orgasm may have much to do with subsequent availability. It is also likely that a trade-off which could assure the female a protective mate and the male a sexual part-

ner would be recognized as workable early on. Perhaps the first woman to fake it was the Ice Age cave dweller breast-feeding a tiny newborn with winter coming.

Whether female orgasmic capacity is an evolving phenomenon or not, what is truly evolving is an increasingly strong conviction among Western women that they themselves are the only appropriate persons to define and interpret their own sexuality. Kinsey's studies suggested that there is an enormous range of interest in sex for both males and females, and differences between any two individuals may be vast. Sexual ideology has tended to be either proscriptive or prescriptive while actually ignorant of reality. Arrogance and naivete have burdened both scientific investigators and lovers; males, who are usually one or the other, have either failed to ask the right questions, asked no questions at all, or misunderstood the answers to the questions they asked. Dr. Jane Calder (8) says "... men can never *know* what female sexuality is all about, because they are never more than tourists in the female's world and like all tourists, they frequently get an other-than-straight count from the natives."

Asked irrelevant questions, women have tended to answer in a manner calculated either to make the questioner disappear or to make him hang around; only rarely will a woman risk telling the truth about her sexuality to a man.

Sexuality is specifically gender-linked, and inferences from the experiences of the opposite sex have only limited relevance. It is phenomenologically impossible to engage psychologically in the sexual personhood of the opposite sex. While it is quite true that many psychological aspects and emotional states are identical in both men and women, sexuality does not seem to be one of these. Sexual emotions and sensations are uniquely and inseparably linked to the structures and minds experiencing them.

Some of the reasons for this are obvious and need no elaboration: females are capable of pregnancy, possess different genitalia, and undergo monthly tides of endocrine stimulation which males can never experience. Females produce food for babies from their own bodies; females have much more sensitivity to odors than do males, thanks to estrogen. Female olfactory acuity may influence women to respond negatively or positively to

the male's pheromones in a way which is not understood today. Females have female brains and respond differently from males to steroid stimulation *in utero*, and exhibit response patterns unlike males' even as newborns (9). Finally, females are apparently patterned both socially and constitutionally in different ways in the utilization of their cerebral hemispheres.

The usual terminologies of anorgasmia are perjorative; I use terms which are operational and descriptive rather than disparaging or suggestive of dysfunction or inadequacy. What other authors define as primary non-orgasmic response or total frigidity, I term a pre-orgasmic state; the implication is clear that the woman has not yet identified or experienced orgasm but can easily *learn* to do so. Secondary anorgasmia is that condition in which the woman has been orgasmic in the past but now experiences difficulty in having reliable orgasms in a way that she values; psychoanalysts might describe this as partial frigidity. Low sexual tension is self-explanatory; for some women sex is a low-priority activity, and they truly wonder what others see in it.

Since most sexual disorder classifications are male creations, the sexually unresponding woman, then, is probably not what males think she is. Her non-response stems from no learning (preorgasmia), communication difficulties (secondary anorgasmia), or low sexual tension. Kinsey demonstrated that the usual statistical distribution obtains in frequency of sexual outlet; some perfectly normal persons simply have no interest in sex. A confusing factor is that some women have orgasms and are unaware of them. The old saying, "If you're not sure if you're having orgasms, you aren't!" is false. This situation will be discussed later.

What kinds of women tend to be regularly orgasmic? Preliminary evidence would seem to indicate: athletic women, creative women, dancers, active women, women who were tomboys growing up; women who are able to relax, women who are aware of their bodies and their senses, and women who honor the sexual component of their lives. Women who are self-actualizing, women who are defiant, assertive, alive; women who have

self-esteem, who can say Yes and No and really mean it; and some women who are shy and passive—all these women can be reliably orgasmic.

Women who have never experienced orgasm from any source of stimulation and who have sought therapy to change this condition seem to have enough factors in common to substantiate the assertion that "frigidity" (a derogatory psychoanalytic label) is culturally determined and socially conditioned. It is simply the psychological state of a woman turning out to be what she was programmed to be. Some analysts—including females (10)—employ the term to describe nearly *all* women, since they define "frigidity" as difficulty in achieving an imaginary entity called vaginal orgasm. This demonstrates imperfect anatomical knowledge; the analysts confuse the birth canal with the organs of sexual pleasure.

BACKGROUNDS OF PREORGASMIC WOMEN

The family backgrounds described by women who have never experienced orgasm have similar features. Usually the parents devalued sex, rarely exhibited demonstrative behavior such as affectionate touching, and clearly approved of "self control." Sex was regarded either as taboo or as sacred and divine, or frequently was never mentioned at all. As a girl, the typical preorgasmic woman received subliminal or overt messages not to touch her body and never to "play with herself." Sometimes she had explored herself and was (or believed she was) punished for this, and often her household had severe modesty rules.

During adolescence, prohibitions became stronger and her parents regarded sex out of context. The growing girl may have felt shame and disgust at the appearance of pubic hair, breasts and menstruation. When she began dating, she was taught that a good girl must suppress and deny sexual feelings, "control" herself and the male, and remain vigilantly on guard lest she "go too far" and "get in trouble." She got the message that far worse than having a disfiguring injury or flunking out of school would be for her to disgrace her family by a pregnancy or a "bad reputation." Some families made violent accusations of promis-

cuity where none existed. In others, the girl perceived sexual hints or demands from relatives, while mother looked the other way.

Frequently a preorgasmic woman has grown up to believe that she does not own her genitals, and that her sexual organs belong to her parents or her husband, to God or the doctor, but never to herself. She is rather vague about her anatomy and usually has never looked at her own vulva. Some of these women are aware that their mothers and sisters neither experience nor expect orgasms.

TWO TYPES OF PREORGASMIC WOMEN

Preorgasmic women usually exhibit one of two responses to sexual stimuli: *no or low feelings*, or *high feelings*. Women with *low feelings* often characterize themselves as "asexual," and make such statements as, "I am totally turned off by sex," "I hate to be touched," "I have never felt turned on in my whole life," "I know other people feel sex, but I have never felt the slightest twinge," "In sex, I endure, I submit, I pretend . . .," "I guess I must be frigid." Quite frequently these women report no pleasant feelings, no sexual fantasies and no physical sensations whatsoever "down there," "below the waist." They may have mildly romantic daydreams but rarely erotic mental images. In the course of treatment, they usually surface anger at their parents, at a religious upbringing and at the lack of sexual tension.

The preorgasmic woman who has *high feelings*—who reaches plateau but doesn't "go over the top"—describes a slightly different situation. She is *very* aware of sexual feelings and is often close to psychological explosion from the high levels of frustrated sexual tension. Her family background may be similar, but she has allowed herself to perceive sexual feelings, and the result has proved deeply anxiety-provoking, because she worries about "not coming." Often she has been in psychotherapy, which changed nothing, or has involved herself in a frantic search for the "magic penis" which could make it happen. These women are troubled by a vicious cycle in which they are convinced they will fail again, avoid sexual activities because of

their frustration, predict failure and then experience it, which inevitably leads to further frustration and avoidance. The spectating and obsessing are probably the primary reasons for the failure to reach orgasm. Such a woman frequently blames her partner for his inability to cause orgasm; she often believes that any interruption to love play must signal the end of arousal for her; she frequently has plenty of fantasies; and her anger is usually directed at the sexual tension itself, at her partner, or at herself.

Both types of women may have already experienced orgasm and not recognized it as such. This failure to label the experience is because:

- the sensations that are felt are either suppressed, ignored or assumed to be something other than arousal-into-orgasm
- some women's body awareness is so guarded that they do not perceive stimuli, even—for instance—a non-sexual touch on the forearm
- women are frequent witnesses to males' orgasms, but rarely are present at another female's sexual climax. Until recently women have been extremely reticent even with close friends to discuss what actually goes on. If a woman assumes that she is like a man, she may expect something like a dramatic erection, a visible ejaculate and detumescence. She may look for much muscular activity, energetic thrusting motions, involuntary pelvic movements, vocalizing and heavy perspiration in herself. Her own patterns of response may be different, so she labels it as non-response
- she herself may be the stimulus for the male's response; his eagerness and speed may incur premature ejaculation and mark the end of love play
- she may not be particularly aroused by the male's arousal if she is inexperienced

- she may believe it is her duty to satisfy the male, and be distracted from her own bodily sensations
- she may have heard or read about peak experiences, and believe that orgasm will be like a skyrocket, atomic explosion, or will cause fainting or insanity

If she is questioned carefully, the woman who thinks she has never had an orgasm may recall situations in which she did have tingling, fluttering, pulsations, throbbing, "drawing sensations," contractions, warm feelings on the skin, spasms, waves, a sense of flooding or release, and a feeling of peacefulness afterwards. She was having orgasms but not labelling them as such.

What is even more confusing, however, is another situation in which the woman is having *multiple orgasms* and failing to label any of them. She fails to stop the stimulus following an orgasm in a series, finds herself in plateau but doesn't recognize it, and ceases sexual activity. Instead of completing the response cycle, she stops on the upswing and is left frustrated and unrelieved (11, 12).

Both kinds of women are usually trying to will an involuntary response while simultaneously suppressing all the sensations leading to orgasm. They are somehow convinced that they can rocket from research and development straight to blast off without a countdown. Frequently they are consciously striving to make themselves obtain an orgasm and are unable to experience the very phenomena which permit climax to occur. A preorgasmic woman expects her partner to cause an orgasm in her without a sense on her part of what might be helpful toward that goal. She has not assumed the responsibility to understand her own sexuality and to take control over the direction of love play for her own pleasure.

Understandably, some women are afraid of men in their adult lives, having had negative experiences while growing up. A significant number of preorgasmic women lived with an incestuous situation for years until they could escape; others were victims of rape, painful intercourse, improperly handled abortion or other traumatic situations. Such a woman may be unable to

imagine any pleasure could be possible from a sexual situation, yet is willing to try to overcome her conditioning. Not infrequently such a woman has *no feelings*.

ROLE AND GOAL EXPECTATIONS

Two other patterns of non-responsivity can be identified, centering in role and goal expectations.

A *role-centered* preorgasmic woman feels that she has no right to pleasure. To be truly feminine, she believes, one must be all-giving; one's husband, one's children and one's employer all come first, and a good woman is glad to accept the leftovers. She has grown up hearing that women should cater to everyone, conceal their competence and protect their male from painful knowledge because men have fragile egos. Men's pleasure is self-validating; women's pleasure is self-sacrifice. She believes she must prove herself pleasing by making certain her husband ejaculates; only then can she allow herself to seek pleasure, but it is usually too late. This approach hasn't produced her orgasm, so she has redoubled her efforts to please her husband, only to find things are twice as bad.

She protects her partner from the painful information that he is not stimulating her in a helpful way, that she is beginning to despise sex, to despise him for enjoying it while she does not, and to despise herself for faking it and being unauthentic. She then vacillates between feeling pride at being "feminine" and fury at being "frigid"; while she is aware that she has gained control over sexual feelings just as she was taught, she knows that she is missing something. Though pleased with the role of super-mother, super-wife, super-secretary or super-feminine, a part of her still yearns wistfully to be super-female—a sexually responsive and adult woman.

The *goal-oriented* preorgasmic woman is one who has put a high priority on achievements. Her sense of identity is derived from academic success, career exploits, performing well in the arts, or making a name for herself outside the home. Often such women are quite witty, remarkably articulate, intellectually gifted, extremely creative or deeply involved in public life as

professionals or volunteers. Some goal-oriented women give the impression of speeding through life, unwilling to slow down for sex except as an afterthought. Some are quite tense most of the time; some seem angry, strung out, agitated; others depressed and distant. In any event, having placed not necessarily a low priority on sex, but a higher priority on other things, they often postpone doing anything about anorgasmia until they begin to view orgasm as an *achievement* they desire. This very striving is what stands in the way of its happening.* Most goal-directed preorgasmic women experience high sexual arousal and cannot "get over the top." (See Table IX)

TABLE IX

RESPONSIVITY MATRIX OF PREORGASMIC WOMEN
FREQUENT TRENDS

	Low Feelings	High Feelings
Fear of men. Inappropriate sexual experiences such as incest, rape, traumas, etc.	X	
Super-feminine role: self-sacrificing, super-mother, super-wife, always pleasing others. "Sex is important only to mate."	X	or X
Goal-oriented: striving, driving, valuing achievement. "Sex is not important; success is."		X

FEARS OF ORGASM

Both kinds of preorgasmic women *fear* orgasm. Their feeling is that they would be vulnerable, or that they would lose control, were they to experience it.

Those whose main fear is vulnerability feel that orgasm would leave them too open to psychological pain and emotional hurt.

*The woman is usually consciously thinking about the situation with the verbal left-hemisphere instead of using the mode of consciousness of the right-hemisphere, which is non-verbal and receptive.

"If I become orgasmic," a woman will say, "I'd be entirely in his power," or "I might become addicted to sex and neglect everything." If orgasm were to occur, "I might be too helpless to defend myself." (This last statement supports an argument that the cave-woman remained on guard, perhaps on the lookout against predators that might attack during sex and devour her young. The fear of being vulnerable may relate to a deep sense of responsibility in females that is part of a collective unconscious sense that "somebody ought to mind the store.")

The fear of loss of control is related to the messages about "good girls" that women receive growing up. It is also the fear of the unknown physical response: orgasm might cause her to lose control of her appearance, urine, feces, consciousness, sexuality. Some women say their fear of orgasm is that it would change them physically (13) and "then everyone would know," or mentally and "then I might not recognize myself." They fear dependence on one man forever, on masturbation, on a vibrator, or on water. "If I were orgasmic, I wouldn't be a good girl anymore," "I would have to grow up."

Yet sexual climax is natural and orgasm in infants under one year has been described by Bakwin (14) and in very young girls by Kinsey (15). Why is it our culture programs out pleasure for women?

Women in our culture do not receive permission to be sexual beings (16) until marriage, and then only partially. The style in which women are required to present themselves is defined as "feminine," and femininity is anti-orgasm. Femaleness (which is determined by XX chromosome at least) is pro-orgasm. "Permission" should come from the major role model—the same-sex parent, but for women it is rarely clearcut. Teen-age boys receive much clearer messages about their sexuality; when father hands over the car keys to his son leaving for a date, the male role-model is symbolically handing over manhood. The adolescent boy is told that it is OK to be sexual, just don't get caught. The adolescent girl is told "don't even think about it."

Little girls are dressed in tiny skirts and then punished for showing their underwear. Little girls are discouraged from exer-

cise, from climbing trees and playing ball: all methods of enhancing the spatial perception and body awareness so essential to sexual functioning. Girls are praised for waiting on other people and hiding their anger and disappointment, for relinquishing their power and becoming passive. Girls are brought up to hide their intelligence and feign ineptitude.

Boys are praised for body contact sports, for spatial activities such as running, climbing, kicking, throwing and catching balls, and learning to operate machinery, all of which enhance depth perception and strengthen the right hemisphere in ways that probably enhance sexual responsivity.

Toilet training is another area in which males have the advantage over females for their future sexual responsivity. When a boy is being taught to stand up to urinate, he receives praise several times a day for holding onto his penis. Every time the two- or three-year-old boy initiates urination in the right place—lets go—he is praised for holding onto his genitals. Girls, by contrast, are placed on the seat and urine simply flows downward from gravity; a girl need not touch herself or assume any special control over its direction. She is touched only by intermediary substances—the underpants, the toilet paper, the washcloth. *She never experiences praise for touching her genitals directly with the hand.*

Girls are probably programmed to be modest more severely than are boys, and girls must cover *two* parts of their bodies. Girls are taught how to please others, how to walk, sit, stand and be “feminine”; boys are taught to value their bodies and use them vigorously and derive pleasure therefrom. Girls are taught cooking, needlework, reading, music and sewing: all left-brain activities. Girls are taught to make changes in themselves for the sake of others; boys are taught to change the world by manipulating objects and concepts. And a boy starts with his own penis!

Girls growing up in our culture rarely discuss their sexuality with other girls, since it goes against the cultural norm (at least in the middle class) even to acknowledge *having* sexuality, except as a means-to-an-end, usually “catching” a mate. A girl who wishes to protect her reputation will report to others how she

managed to keep a boy under control, not how good it feels to make love. Without information from others—siblings, parents, friends—women grow up ignorant of practically everything that would be helpful in becoming orgasmic.

Certainly girls who masturbate either assume *everyone* does as they do (“I’m not unusual”) or *no one* does (“I’m perverse”). But since it is never discussed, they have no way of knowing.

→ Boys often experience orgasm accidentally, from rough-housing with other males, being stimulated by playground equipment, or absent-minded fooling around with the penis, which is highly accessible. Many boys have heard about masturbation from other boys and go home to try it. For many boys, learning how to masturbate is an accomplishment to boast about. It is not so for girls.

From dating on through adult life, women are taught that they must control the situation in sex, usually in a totally negative manner. It is always *stopping* what is going on, never beginning or continuing. Women are expected to exercise restraint; men to push the limits. Girls “must” stay out of trouble (bad reputation, conceiving, getting boys mad at them for teasing, etc.) and boys are “expected” to get into trouble.

The functions that are physiologically discrete in women—elimination, reproduction and pleasure—are all united in men. The male’s penis combines what is separate in females, and males have derived erroneous theories of consonance from this fact. Since the organ that seems meant to receive the penis provides the male *his* pleasure, he assumes that it ought to provide pleasure to the female. When it has not, males have defined her as inadequate or sick.

Women learn how to experience femaleness from women; femininity is achieved *for* the male. Women can learn much from males and can be usefully counseled about careers, disease, academic matters and so on. But male counselors can never credibly convey the experience of being another sex and perceiving emotions and sensations inevitably felt only by another sex. Males seem unable to escape conveying an “ought” label to their clients; female therapists are well aware of what “is,” and are more able to help a woman distinguish among her perceptions

and emotions in ways males cannot (18). Of all the books that purport to convey the female experience, *Sexual Honesty: By Women for Women* (19) seems to be the most believable and useful.

Marilyn Marcus (20) has said that "women have two left brains." The high verbal ability of some women and their sensitivity to stimuli are two important factors which are detrimental to sexual pleasure (21). Even when women know how to be orgasmic, the intrusion of thought acts as a powerful suppressor to bodily sensations. It is commonly believed by husbands that wives come to bed with "too much on their minds" purposely to frustrate them; what may be true is that a woman has enormous difficulty in shutting down *thinking* and switching to what Deikman (22) terms the receptive mode, which is right-hemisphere consciousness. In teaching women to experience their bodies, a very useful distinction is to instruct them to listen to their own breathing. This exercise is helpful for at least three reasons: hearing is largely a right-brain activity; attending to body sensations helps suppress cognitive (left-brain) activity; and attending to breathing aids relaxation, encourages alpha wave states and enhances sexual perception. The utilization of breathing may call to mind a classic definition, "Yoga is the intentional stopping of the spontaneous activity of the mind substance."

What should be clear, in this discussion of sexuality and the preorgasmic condition is that the major sexual organ is between the ears. As long as women are programmed to suppress, deny, alter and distort their sexual awareness, there will be anorgasmia. If male theoreticians insist on a sexuality which doesn't exist, there will be women who, in trying to please men, will lose their power to be sexual.

Women—such as Betty Dodson, Kathie Kelly and the Boston Women's Health Collective—are the legitimate definers of female sexuality. Women must accord themselves adult personhood, since it seems clear that neither their partners nor their culture will readily do so.

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11. Bardwick JM: *op cit*, p. 65. "The more closely the female orgasm approximates the intense orgasm of the male, the more satisfying, satiating and 'final' that orgasm is."
12. Kinsey AC, et al: *op cit*, p. 376. "Hamilton (1929) considered multiple orgasms related to clitoral orgasm, and labeled it nonterminative minor climaxes and in actuality an orgasmic incapacity." This view was shared by Kelly (1930) and Clark (1937), according to Kinsey. More current authors (Katchadourian HA and Lunde DT: *Fundamentals of Human Sexuality*. New York, Holt, Rinehart and Winston, 1972) similarly misinterpret the Masters and Johnson type B female response cycle, and as recently as 1966 a woman psychoanalyst asserts that multiple orgasms are a type of frigidity (Shainess N: A reassessment of female sexuality and erotic experience, in *Science and Psychoanalysis*. New York, Grune and Stratton, 1966).
13. Haley J: *Uncommon Therapy*. New York, W. W. Norton, 1973, pp. 108-109, which describes the work of Milton Erickson, contains a fascinating discussion, suggesting that there are immense physical changes in the sexually active woman. Her skeletal calcium changes, her foot size increases, and there are transformations of eyebrows, chin, jaw, nose, hips, spine, hair and breasts after "as short a time as two weeks of ardent lovemaking."
14. Bakwin H: Erotic feelings in infants and young children. *Amer J Dis Children* 126:52, 1973.
15. Kinsey AC, et al: *op cit*, p. 141, cites more than a dozen authors who have recorded autoerotic behaviors in girls under three.
16. Berne E: *What Do You Say After You Say Hello?*. New York, Grove, 1972, p. 124, develops the concept more fully. He says that children learn from the parent of the same sex and do it for the parent of the opposite sex.

17. Friedman LJ: *Virgin Wives*. London, Tavistock, 1962, p. 39. The spindle in *Sleeping Beauty* symbolizes "mother's prohibition of sexuality to her daughter."
18. Friedman LJ: *op cit*, p. 34. "Those (therapists) who are the most experienced and sensitive with vaginismus and unconsummated marriages . . . are all women. They are the most cognizant of the emotional implications and to the relationship meanings of treatment, possibly because women have an empathetic understanding based on their own life experiences."
19. Hite S: *Sexual Honesty: By Women for Women*. New York, Warner, 1974, presents a cross section of responses to a questionnaire about subjective experiences in sexual functioning in women age fourteen through sixty-four.
20. Marcus M: personal communication.
21. Bardwick JM: *op cit* credits both Masters and Johnson (p. 60) and Sherfey (p. 67) with the observation that sex and thinking are incompatible activities.
22. Deikman AJ: Bimodal consciousness, in Ornstein RE: *The Nature of Human Consciousness*. San Francisco, W.H. Freeman, 1973, p. 71: "In most receptive-mode conditions . . . an active relationship with the environment takes place, as in the case of . . . lovers in sexual intercourse."

Chapter XV

VARIETIES OF SEXUAL EXPERIENCE

Linda Whooley and Tee Kamen

With the advent of the woman's movement and its concomitant feminine awareness, women began actively pursuing their sexual independence. Early in 1972 in the San Francisco Bay Area, Lonnie Barbach pioneered a radical new approach to treating anorgasmia in women (1). The Barbach method, which we use in a series of classes on female sexuality, teaches women to become orgasmic through self-stimulation. Once orgasmic, they can begin to share this response with their partners, if they so desire.

In the process of teaching these responses, we discovered several distressing voids. First, we became aware of a lack of knowledge of their own bodies by the women in the groups. Many adult women have never looked carefully at their own genitals, and many do not have correct names for their sexual anatomy. Correct labeling is an essential step toward reclaiming their bodies and accepting their own genitals in a positive way.

Secondly, in researching the topic of female sexuality, we discovered a dismayingly lack of literature on the topic of female masturbation. We decided to supplement this scant information by developing our own resources and practical guidelines in this area. In order to teach women how to stimulate themselves to orgasm, we began to gather specific details about how orgasmic women pleased themselves. Women often ask us what areas are sensitive and where other women stimulate themselves. Another concern is that of how and with what women stimulate themselves. The following is a summation of some of the material that we tell our classes:

Primarily, women stimulate the glans (head) and the shaft of the clitoris. The motions may include rubbing, rolling or pressing on the shaft, and rubbing, tweaking, squeezing, pinching, or tapping the glans. They may use one or more fingers or their

whole hand. They may also stimulate either side of the shaft, the inner and outer lips, the vestibule area or the opening of the vagina. Many women include some form of anal stimulation or anal containment in their self-sexuality. Some enjoy vaginal containment of an object, e.g., candles, bananas, cucumbers, plastic jars, along with clitoral and/or anal stimulation. Many women also like to stroke their breasts, stomach, or inner thighs. *good porn*

The one consistent element in the way women touch themselves is that it is rhythmic and repetitive. Lubrication is often used: vaginal lubrication, saliva, jellies, lotions and oils, including cooking oils. The actual stimulation can be applied in many ways. Women use their hands, a stream of water (as from a bathtub faucet), pillows, bunched bed clothes, vibrators, candles, and other objects—primarily to stimulate their clitoris. Positions for self-pleasuring range from lying on the back with legs widely spread, to various side postures, to squeezing the thighs while lying on the stomach. Women may move their body against a stationary object, they may move the object, or they may move both in unison. We encourage women to experiment in order to fully develop and perceive their own orgasmic potential.

We also support women in their search for what turns them on. Fantasies and erotic literature are shared and discussed in class. We encourage participants to write female-oriented erotica. Most of what is now available is developed from a male point of view, although this, too, can be arousing. *see page 98*

Many women voice resentment at the male orgasm. They believe it to be easier and more reliable than their own. Often men and women expect that a woman should reach orgasm through penis in vagina alone, as men do. This type of "Look, ma, no hands!" orgasm is simply not in the realm of reality for a great number of women, since, neurophysiologically, the clitoris is the sexual organ and the vagina is the reproductive organ. These functions are united in the male's penis. Additional manual stimulation by partner or self is often essential for the female orgasm. This information, along with confirmation by other group members, allows the women to develop realistic expectations and patterns of behavior. It is essential that women (and men) understand that male and female sexual patterns are not identical. *Miller's Wall Street 1978*

OUR QUESTIONNAIRE

The women in our classes bemoan the lack of accurate, unbiased information on the subject of self-stimulation. For this reason, we developed a questionnaire on methods of self-pleasuring, so that factual material would be available to women. We distributed the questionnaire to a number of acquaintances and have summarized here the responses of ten women.

Such a small group cannot, of course, be generalized to the population as a whole. What it does do is to confirm our conversations with hundreds of women, in personal and telephone counseling; women are less like each other than men; women have a very wide variety of sexual experiences, styles, preferences and patterns. The following histories will illustrate this.

TERRY. Terry is a 27-year-old office worker with a Master's Degree. She is bisexual, sometimes preferring men, sometimes women. She socializes her sexuality in monogamous relationships and closed marriages. Her first orgasm was from using her hand. She is now orgasmic with partner through oral sex, manual stimulation, and combinations which include manual stimulation.

"I started masturbating when I was twenty-two. Prior to this I had had relationships with men which ranged from terrific to satisfactory, depending upon the man involved. I had been playing with myself for some time, as I found that I would get itchy whenever I would get horny. I would rub a lot, but never to orgasm. Actually, I didn't really realize that it could happen by myself alone. I guess I was kind of naive, sexually (I was!).

"Then, about age twenty-two, I met a woman at school (whom I later married) who told me about masturbation—how it was done and what would happen. This was hand stimulation only. However, my activities were limited—at least I masturbated a lot less than I do now.

"My wife and I really enjoyed masturbation. Frequently, one or the other (more usually me, as my sex drive was stronger than hers) would be horny and the other would be too tired to do anything. I would masturbate and she would hold me and urge me on and caress me. Thus, we both felt satisfied. In fact, masturbation became a very large part of our sex lives. We would have races to see who would come first, and/or try to both come at the same time—the one waiting for the other.

"In fact, we didn't like the word 'masturbation' and wanted

another one for the process. After all, men had 'jack-off,' so women should have something, too. So, we invented our own: 'rubup,' since that seemed to describe it accurately.

"I have also used vibrators in 'rubbing-up.' They don't seem to achieve orgasm all by themselves, but with a little hand stimulation, they do just fine, especially if you're pretty tired.

"Now, I usually rub-up every night. I need at least one orgasm just to relax me for sleep and more frequently than not, I rub-up again. With hand stimulation, I can come three or four times in the space of about twenty minutes or less—if my hand holds out.

"Right now, rubbing-up is my only form of sexual stimulation and that's O.K. Masturbation is really quite satisfying for me. Having become very adept at it, I find self-sexuality allows me a lot of freedom. I'm not dependent upon another person for sexual fulfillment. The loss of a partner does not now mean an end to my sexuality. Actually, I'm very dependent upon it now and really get up tight and horny if I haven't rubbed-up for a couple of days."

ANNIE. Annie is a 23-year-old artist with a B.A. in art. Her sexual orientation is self, hetero, bi, and combinations of two men and one woman or two women and one man. Her socializing preference is deep multiple relationships. She first masturbated at age nineteen using her hand while stoned. She remembers being caught pretending she had a penis (baseball bat) at age five and being spanked. She is now orgasmic with partner using a combination of penis and vibrator.

"I don't fully know what my sexual preferences are. Masturbating with pornography is my latest reality. Anal-manual descriptions are particularly stimulating, as is male homosexual activity. Most of my orgasms in the last months have been while reading *The Pearl*. I like trashy sexist American porn, too.

"I generally use my hand (right, middle finger), since my vibrator conked out. Masturbation is my only (almost) sure method to reach orgasm. *More House* gave me my first permission to pleasure myself. I am still working through my 'shoulds' and I want to let go more."

MARIE. Marie is a 33-year-old with a Master's Degree in Literature. She is heterosexual. At around age seven she first masturbated; she experimented with water in the bathtub and also with a dog. She is now orgasmic with partner with penis in vagina and through oral sex.

"I had a pet dog who began to lick my vaginal area and found I liked it very much. After that I encouraged the dog to lick me. Soon after, a friend told me about using the stream of water in the bathtub. I used this method more often because the dog wouldn't always cooperate. Later I found that a lipstick container

worked very well. For a time I also used a large quartz crystal. I do not like using my fingers when I actually want to come, because I have hooked myself badly with my fingernails. During my marriage, I continued masturbating regularly. I find sex with a man quite different from masturbating and enjoy both equally. Masturbation has the plus of being available at all times. Sex with a partner has a warmth and physical closeness and mental togetherness that I enjoy. During some teenage lesbian experiences, I learned a great deal about caressing foreplay and where I like to touch or have my body touched. I still have found no man who can touch me as gently as another woman or myself.

"By the time I heard my first scare stories about masturbation, e.g., deafness, insanity, I had been masturbating so long that I knew those things had not happened to me and must be more adult lies. However, I did have knowledge from the very beginning that what I was doing would displease adults, so I was always very careful. I didn't ever feel guilty about masturbation, but did not talk about it to anyone until recently for fear of upsetting them."

CINDY. Cindy is 23-years-old with two years of college. Preferring self and homosexual activity, she socializes in casual multiple relationships, one primary with another secondary, and enjoys group sex. She is orgasmic with partner through oral sex, manual stimulation, and oral and manual combination. She is also orgasmic with "dyking," i.e., mutual rubbing of genitals with thighs. She started masturbating at age thirteen when her sanitary napkin would rub her during the night.

"My sanitary napkin would get caught up tight during the night, and I'd wake up in the morning to find myself rubbing against it. I never knew what orgasms were, however, until I started having them with a lover (male) when I was eighteen, and didn't begin consciously masturbating until a year or so ago. I have only in the past one-half year succeeded in having orgasms by masturbating.

"Once my mother saw me with my hand in the front of my pants purely for exploratory purposes—I don't recall any pleasurable sensation—and gave me a lecture on dark, warm, moist places being ideal for breeding germs (I was maybe five).

"About two years ago a friend gave me her old vibrator. I didn't do much with it until a year or so ago, when I began to be attracted to the idea of being able to be sexually independent and not have to go out and cruise every time I got horny and didn't have a lover (which I usually didn't have). I mainly used my hand, but it took so long to get anywhere near orgasm I always gave up. Then, about six months ago, I started playing exciting music while masturbating and finally succeeded in coming all by myself.

ELLIE. Ellie is a 36-year-old. She is a sex counselor with a Master's Degree. She is heterosexual and presently involved in an open marriage; she first masturbated at twenty-four using her hand. She is presently orgasmic with partner through oral sex, manual stimulation, and penis in vagina, plus self-masturbation.

"My partner stimulated me manually to orgasm after my first intercourse experience. Wow! So that's what it's all about. Now I use my hand, a vibrator or water. I've had the experience of three vibrators at the same time, in the clitoral, vaginal and anal areas. There's no way to put the sensations in words!"

MARILYN. Marilyn is a 27-year-old teacher with a Master's Degree. She lists her sexual preferences as: self, hetero, homo, and bi. She socializes in casual multiple relationships and monogamous primary relationships. She was twelve when she first masturbated by using her hand. She is now orgasmic with partners with penis in vagina, using additional stimulation on the clitoris.

"When I was twelve or so, I used to play a game in the bathroom with the door locked while I was supposed to be taking a shower. I would pretend that I was a baby, put a washcloth between my legs, spank myself as if I had been a bad child, and then I would urinate. Eventually I guess, it led somehow to rubbing myself and one time I came without knowing what it was. I took awhile before I'd masturbate by touching my clitoris directly—I did it through my undies for a long time. Recently I've gotten into vibrators—no insertion—clitoral only, and I really like it. I tried water, but it's never worked.

NAN. Nan is forty, has a B.S. Degree and is a registered nurse. Her sexual preferences are self and hetero and she socializes her sex in casual multiple relationships and in one primary with other secondary relationships. She was thirty-five when she first masturbated, using her hand while reading an erotic book.

"I do not remember anti-masturbation messages. I did get fearful messages from my mother regarding rape, pregnancy, being taken advantage of, etc. Sex education and facts about menstruation were good. Information about pleasure, emotional warmth, etc., very scanty.

"I was especially concerned about being non-orgasmic when I got married (at age thirty-two)—got bad advice from MDs, i.e., 'it's very common and not important.' I started reading sex books—David Reuben, *The Sensual Woman*, etc. and thought about getting a vibrator. First orgasm while reading. Vibrator was great. Later started being orgasmic with partners who would take the time to stimulate my clitoris directly.

"I usually masturbate in bed with finger or vibrator—sometimes stoned—sometimes with cylindrical objects in vagina and/or rec-

tum. Also, I masturbate with partners when it seems that I won't come otherwise. I am finally comfortable with this and find that most partners are too—some joining me in masturbation. I usually masturbate once or twice a week depending on what else is happening. Sometimes I can happily go a long time without it. It's a great sleeping pill when I'm tense or jumpy."

AMANDA. Amanda, age thirty, is a bisexual who enjoys group sex and voyeurism. She likes serious multiple relationships which are non-monogamous only. At twenty-one she began masturbating. She told her psychoanalyst and he said it would give her inorgasmia (which she already had).

"Started masturbating after I'd been balling without orgasms for four years. I was at that time an inpatient at Hillside Mental Hospital in New York, with a primary complaint of hysteria and bad relationships from inorgasmia. A Freudian analyst told me it was bad for me in all the usual ways;—with some trepidation I got into masturbating every night. I had a weak orgasm after about a week and one incident of urinating that scared me a lot.

"I got out and masturbated on the sly with(out) my old man—his duplication of my techniques still didn't do it. My first orgasm with a partner was at age twenty-three—regular with partner from age twenty-five. I didn't masturbate then out of guilt even though he would sometime deliberately make me go without orgasm for months.

"Age 25 I had baby, and got liberated. I'm masturbating rarely, without guilt, but not much interest—believed it would lower my desire with partners.

"Orgasms with partners are now pretty regular. First orgasm during intercourse was in 1970. First multiple with partner 1973. Since joining San Francisco Sex Information staff, I have become much more active with myself. Use self-sexuality and fantasy a lot—finding out more about myself every day.

"Have been exploring my asshole; I now prefer to get it on with my left hand on my clit and my right hand with two fingers in my cunt and one in my asshole. Showers are nice. Fantasies put me to sleep, but orgasms wake me up.

"Not multi-orgasmic by myself. Vibrators are nice for foreplay. I like masturbating with partners and while fucking a lot! I find it impossible to read even clinical and anatomical sex books without pausing to masturbate, ditto porn, even S & M!"

SHERRI. Sherri is a thirty-nine year-old sexuality discussion leader. She is bisexual and prefers to have one primary relationship with other secondary ones. She first masturbated at age thirty-three using her hand. She is now orgasmic with penis in vagina, with oral sex, and with manual stimulation.

"I was about thirty-three, and although I had played around a little with my genitals, I had never before masturbated to orgasm. I was lying on the couch talking on the phone with a man I had recently met. I was planning on having my first date with him that evening. I was very excited because it had been a long time since I had been with a man. As I was talking with him, making arrangements for our date, I was fondling my genitals. I was *so* horny and could hardly wait to be with him sexually. After we hung up, I continued to rub myself, right on the clitoris, and I had a *fantastic* orgasm.

"Prior to that time I had not been orgasmic at all. I did not really have any information on what orgasm was, so, for all these years, I was 'imagining' orgasms in my head.

"I kept practicing with my new found joy, became more aware of what I was missing during sex with partner, and after about two years, I told the man with whom I was living that I was not being orgasmic with him, nor with any other man. I then got a vibrator and after a little practice by myself, I masturbated in the presence of my partner using my vibrator. Knowing that I could bring myself to orgasm after my partner had climaxed, helped me to relax more with him and I stopped 'trying' to have orgasms during intercourse. Instead, I just focused my attention on the total lovemaking experience, tried out a lot of different positions in intercourse, and had the comforting thought of knowing I could reach my orgasm afterward by myself. Eventually, when I least suspected it, I had orgasm with his penis in my vagina. Occasionally, I masturbate myself during intercourse and reach orgasm most of the time. I feel really good about my responsiveness and so does my partner.

JESSICA. Jessica is twenty-nine and has completed two years of college. She is heterosexual and enjoys self-sexuality. She socializes her sex in one primary relationship, with other secondary ones; prefers open mutual open marriage. At age nine or ten she began to masturbate using her hand and a back scrubber in the bathtub. She is now orgasmic with partner in penis in vagina, with manual stimulation and with a combination of penis rubbing clitoris or penis inside and hand outside.

"Earliest I remember is feeling good when washing in bathtub, first orgasm when trying to do that again by washing, squeezing legs together, then rubbing with handle of the back scrubber, having multiple orgasms . . . trying to hold out as long as possible, but sometimes missing if I did that. Also having lots of fantasies . . . sometimes of being seen, sometimes of being examined, sometimes of being made love to by women, older women, anal sex. Always rub entire vulva, one middle finger on clitoris, around

then up and down. Then also trying other positions . . . looking in mirror, rubbing on the cold sink, standing in shower with clothes on, under water while people were around, while driving once, but it was too dangerous to complete. Then I got married (feeling guilty about 'infantile' level of orgasms) and never had had vaginal orgasms. After lots of fucking, I found that my best experience with men revolved around cunnilingus and manual play . . . husband good at oral sex and manual play with which I could have multiple orgasms. Then I began having 'vaginal' orgasms in woman-astride position. Whenever I was bored with fucking I would masturbate. I did a lot while pregnant . . . he would, too. It turned me on to watch, and he watched (more uptight, though). I love to excite a man by masturbating. I began using dildoes vaginally and anally while masturbating, or I would masturbate while being fucked in vagina and with a finger in my ass (very good). I would get uterine contractions while masturbating and pregnant. Too intense. Also have good orgasms in sleep (dreaming) if not having orgasms awake. I'm no longer with my husband.

"Last boyfriend uptight about most sex; no oral sex (which I loved when astride the man's mouth) and he felt morally uptight about masturbating. He used *me* for release . . . then I taught him to do me manually, only one orgasm per time. I find I am more uptight about masturbating now. I'm very stiff, and don't move around to make noise . . . masturbated once in front of him . . . it wasn't too great . . . I once tried in bed while he was asleep . . . the tension of holding still and 'orgasming' almost made me pass out . . . too heavy. I like to sleep alone to masturbate, but it wastes my sexual desire for men . . . which is much less than I used to have . . . still like to have multiple orgasms, they're O.K. but not as good as before. Have new boyfriend, hope he's into masturbation, oral sex; also hope to rediscover erotic fantasies. Thanks, I had a great time remembering all this."

DISCUSSION

The women who have provided these histories may not be statistically typical. In Kinsey's sample of 5,000 women, by age twenty, forty per cent of women had had at least one masturbatory orgasm. The mean age at which our ten women learned effective self-stimulation was 19.6 years. Our group may be slightly ahead of the norm, but when compared with the orgasmic experience and facility of men, it is easy to see that women start the fifty yard dash with a hundred yard handicap!

This sample probably has a higher percentage of homosexual and bisexual experience than the general population and has a smaller proportion of ongoing marriages than other women of the same age. Nevertheless, their struggles are not unlike the struggles of women everywhere.

Some of the women we know began masturbation (and teaching it to others) by age six, but it's not rare at all for women to be well past voting age before they begin to own their own bodies.

In counseling non-orgasmic women, we have found the writings of Hite (2) and Dodson (3) helpful. The former describes the developmental and sexual struggles of many women, while the latter is more the personal saga of a gifted radical thinker. Many women find solace and encouragement in these writings; we hope that similar comfort will be provided by the stories we have presented here.

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Chapter XVI

STEREOSCOPIC ILLUSTRATIONS

Dr. David L. Bassett's *Stereoscopic Atlas of Human Anatomy*, published fifteen years ago, set a new standard for medical illustration, as the Sawyer's Viewmaster Reel format provided a three dimensional, color picture unequalled in the field of biological photography. Since then, atlases for ophthalmology, ophthalmoscopy and orthopedics have appeared, and others are in preparation.

Like most other parts of the human body, the clitoris is not adequately represented on a two dimensional printed page. The following stereoscopic illustrations show some of the range and variety of the size, pigmentation, mobility and preputial coverings of the clitoris, as well as the complex interfoldings where prepuce and labia minora join.

Most of the views were taken by John W. Binckley, M.D., using a Canon 35 mm camera, mounted on a rack-and-pinion bar, which provided for horizontal motion between the two exposures. Lighting was by electronic flash. The film is Kodachrome II.

The clitorides shown here are all within the range of normal. The captions comment on the natural variation which is visible, but it should be clear that none of the sizes, shapes or pigmentations shown are abnormal, except view 28.

1. A 36-year-old fair-skinned Caucasian woman. The darker-pigmented labia minora merge gradually into the prepuce, which entirely conceals the clitoral glans. The ruler indicates size.
2. Same case as 1. Vertical and lateral traction have retracted the prepuce, revealing the glans. The veins visible above the prepuce suggest parity.
3. Same case as 1. The anterior end of the vestibule is visible between the labia minora and below the clitoris.
4. Same case as 1. Vertical traction alone has retracted the prepuce, while the labia remain in apposition.

5. Same case as 1. Lateral traction shows details of preputio-labial junction, which is not bilaterally symmetrical.
6. Same case as 1. Stronger vertical and lateral traction fully opens the vestibule and reveals most of the glans. The urethral meatus appears at the lower margin of the photo.
7. A 37-year-old Caucasian woman with light-brown hair. The glans is concealed. The clitoral shaft appears longer than in case 1. Labial pigmentation and corrugation are both less prominent. There appears to be a dorsal slit in the prepuce.
8. 30-year-old Spanish woman, with olive complexion. The clitoris is slightly larger than average and is seen in its natural, unretracted state.
9. 40-year-old Caucasian woman with fair complexion. The shaft of the clitoris is buried under the cylindrical fold of tissue which projects forward and towards the viewer's right, terminating in the prepuce. The glans is largely hidden under the prepuce, where the upper margins of the labia minora terminate.
10. Same case as 9, with the mons tissues retracted laterally and upward, revealing the glans. The labia minora join and terminate on the lower surface of the glans, forming the frenulum of the clitoris. Parity is indicated by the veins above the prepuce. There are signs of mild vaginitis and irritation.
11. 32-year-old Caucasian woman with darker than average pigmentation. The labia minora, extending from below, are in apposition, while the prepuce covers the glans.
12. Same case as 11. With upward traction, the glans becomes visible. The prepuce and labia minora appear mildly edematous. The urethral meatus is visible between the labia; below that is the beginning of the vaginal opening, coated with a moderate vaginal discharge.
13. A fair-complexioned redhead. The clitoris is more hooded than usual and perhaps a little larger than average. Mild irritation in the folds of the skin.
14. 28-year-old Caucasian woman of average pigmentation. The clitoris is larger and more hooded than usual. The upper labia minora wing out anteriorly much more than usual. The urethral meatus is visible.
15. Caucasian woman. The clitoral shaft is unusually long. The glans is not visible, being covered by prepuce above and labial lips below. The vestibule is in shadow behind the lips.
16. The labia minora touch throughout most of their length, completely obscuring the vestibule; the prepuce covers the glans.
17. Same case as 16. Even with lateral traction, the glans remains concealed. This view illustrates the *Gray's Anatomy* description of the anterior termination of the labia minora:
The upper division passes above the clitoris to meet its fellow of the opposite side, forming a fold which overhangs the glans clitoridis, and is named the preputium clitoridis; the lower division passes beneath the

clitoris and becomes united to its under surface, forming, with the corresponding structure of the opposite side, the frenulum of the clitoris.

Clearly, this description does not fit every woman.

18. Postpartum state illustrated by recently shaved public hair. The glans appears average size and is visible without traction. The labia are average in length, in contrast to view 16, where they are shorter than average.
19. Same case as 18. Slight traction shows most of the glans; the shaft lies between the two fingers. The urethral meatus appears as a dimple in the vestibule.
20. The shaft appears longer than average. The glans is hidden beneath the prepuce. The skin of the vulva appears dry, flaking and irritated.
21. Caucasian woman with slightly darker pigmentation than average. One labium has several folds, with divisions merging in the mons area, unlike the textbook description.
22. Same case as view 21. With later traction, the vestibule lies open and the prepuce retracts slightly, but the glans remains largely concealed. There is a moderate vaginal discharge.
23. A fair-complexioned redhead. The clitoris is totally obscured by labia, prepuce and pubic hair.
24. Same case as view 23. With upward traction, the shaft is outlined under the preputial skin, between the fingers. The labia are somewhat longer than usual; one remains folded centrad, largely obscuring the glans. There are signs of skin irritation, with moderate vaginal discharge.
25. The clitoral area lies deep in the furrow between the labia majora, obscured by shadow and pubic hair. This is a frequently encountered phenomenon, and one which requires retraction of surrounding tissues in order to visualize the clitoris.
26. Same case as view 25. With upward traction, the glans is exposed, including the termination of the lower division of the anterior labia minora, which join the under surface of the glans. There appears to be a surgically made dorsal slit in the prepuce.
27. Generally light pigmentation in a postpartum woman. The structures are of average size. The glans lies beneath the prepuce; the labia minora overhang the vaginal opening.
28. A case of clitoral agenesis. The vaginal orifice and hymeneal area appear bright pink. On either side are the pigmented labia minora, one larger than the other. Above the vagina is an area of shiny white skin where the clitoris would normally be. (Case of Dr. H.C. Falk; non-stereo view.)

Publisher's note: Additional or replacement reels are available from the publisher.

INDEX

- Adhesions, 5, 106, 107
- Age-grading, 141
- Agnesis, 100, 251
- Akkadian, 171, 172
- Algeria, 185
- Alkaline phosphatase, 87
- Alpha waves, 219
- Amharic, 173
- Anal stimulation, 214, 240, 245, 247
- Anatomy, 9, 249
- Anatomy, comparative, 23ff
- Anorgasmia, 207, 208, 227
- Anthropology, 111
- Appetite, 60
- Arabian Nights*, 188
- Arabic, 183
- Artiodactylia, 26
- Arousal, sexual, 60, 64
- Asaorta, 119
- Australia, 150
- Bagishu, 145
- Bartholin gland, 12
- Bestiality, 242
- Blood vessels, clitoral, 15, 79, 80
- Body image, 59
- Bone, clitoral, see *Os clitoridis*
- Buddhism, 214
- Bulbs, vestibular, 9, 70
- Carcinoma, 100
- Cat, 28
- Celtic, 168
- Cerebral laterality, 236
- Chauvinism, medical, 2
- Chinese, 176
- Cholinesterase, 87
- Circumbustion, 117
- Circumcision, 106, 113ff
- Cleopatra, 124
- Clitoridectomy, 105, 114, 126
- Clitoris, function, 24
- Corpora cavernosa*, 75ff
- Cow, 26
- Culture diffusion, 156
- Cunnilingus, 190, 242
- Cunnus, 168
- Cytochemistry, 87
- Danish, 167
- Diencephalon, 46
- Dog, 28
- Dorsal slit, 250, 251
- Egypt, 113
- Egyptian, 174
- Electroencephalogram, 213, 219
- Electron microscope, 91
- Elephant, African, 32
- Embryology, 17, 36, 194
- Erection, clitoral, 65, 81, 83
- Ethiopia, 119
- Etymology, 162
- Ewe, 26
- Faking, 225
- Family therapy, 196
- Fears, orgasmic, 232
- Feedback, positive, 61, 63
- Femininity, 233
- Feminism, 35
- Fiber size, nerve, 37ff
- Fibroma, 100
- Flemish, 167
- Galla, 119
- Genital corpuscles, 20
- Glans clitoris, 13, 14, 23
- Glomus tumor, 100
- Gorilla, 32
- Guinea pig, 27
- Hamster, 27
- Hebrew, 173
- Hemangioendothelioma, 100
- Herodotus, 123
- Horse, see mare

- Hyena, spotted, 28
 Hypertrophy, 99, 107
 Hyperventilation, 219
 Hypothalamus, 54
 Indian (American) languages, 180
 Indo-european Languages, 167
 Indonesia, 178
 Infibulation, 113ff
 Innervation, clitoral, 18, 24, 37, 94, 96
 Innervation, penile vs. clitoral, 41
 Iraq, 185
 Irish, 220
 Intersex, 98, 99
 Introcision, 117
 Japanese, 177
 Javanese, 179
 Jazz, 165
 Kegel exercises, 211ff
 Kikuyu, 135
 Krause bulbs, 91, 94
 Latin, 168
 Learning, and sexuality, 62
 Leiomyosarcoma, 100
 Lemur, 29
 Libya, 185
 Lipoma, 100
 Male-female differences, 225
 Man in the boat, 165
 Maori, 154
 Marc, 25
 Masturbation, 64, 128, 130-132, 147, 201, 239-247.
 Meissner touch corpuscle, 91, 94
 Melanoblastoma, 100
 Melanosarcoma, 100
 Menstrual cramps, 216
 Merkel tactile disc, 91, 94
 Micronesia, 155
 Monkey; New world, 29
 Old world, 31
 Spider, 29
 Moro, 149
 Mouse, 27
 Mucocutaneous end organ, 89, 93
 Muscles:
 pelvic, 10ff
 bulbospongiosus, 10
 constrictor vestibuli, 23
 constrictor vulvae, 23
 corpus cavernosum clitoridis, 23
 ischiocavernosus, 10
 pubococcygeus, 211ff
 retractor clitoridis, 23
 transversus perinei superficialis, 23
 Myoblastoma, 100
 Myo-epithelial cells, 82
 Nandi, 144
 Native American languages, 18
 Neurilemmoma, 100
 Neurophysiology 35ff, 204, 213, 218-220
 Oedipus complex, 197
 Orgasm:
 baseline contractions in, 68, 71
 "clitoral", 203, 209, 210
 female, 194, 199, 206-208, 210, 214-217, 244ff.
 multiple, 215
 muscles in, 66-71
 pubococcygeus in, 68
 physiology, 65ff
 "vaginal", 199, 203, 209, 210
 Orgasmic platform, 213
 Os clitoridis, 24, 28, 29, 30, 31
 Pacinian corpuscles, 19, 37, 40, 60, 87, 91, 94
 Paleoanthropology, 122
 Paleolithic era, 224
 Palestine, 148
 Pano indians, 118
 Papyamentu, 168
 Pathology, 98
 Pelvic congestion, 216
Perfumed Garden, The, 187
 Perineum, 10
 Perissodactylia, 25
 Persian, 169, 186
Petit mort, 205
 Pharaonic circumcision, 113
Playboy, 196
 Politics, sexual, 216, 217
 Polynesia, 153
 Potential, electrical, 42ff
 Prepuce, 14
 Psychoanalysis, 197, 206
 Psycholinguistics, 162
 Psychosexual ethos, 144
 Puberty rites, 142ff
 Rabbit, 28

- Racial differences, 112
 Rat, 27
 Rectalgia, 212
 Reflexes, spinal, genital, 41
 Reichian psychology, 199, 216
 Rites of passage, 142
 Ruffini end-organs, 91, 92, 94
 Sanskrit, 169-171
 Semitic, 171
 Sex technique, 203
 Social class, 195
 Sociology, 195
 Somali, 119
 Sow, 26
 Smegma, 5
 Spanish, 169
 Spinal cord, 48ff
 Sudan, 113
 Sunna circumcision, 115ff
 Surgery, 105
 Syria, 184
 Tarsier, 29
 Thalamus, 53, 55, 57
 Therapy, 239
 Toilet training, 234
 Trauma, 109
 Triangle, urogenital, 10
 Truk, 155
 Turner's syndrome, 99
 Urdu, 170
 Urethra, clitorine, 23, 29
 Vagina, sensitivity of, 95, 96
 Vaginitis, 250
 Vater-Pacini, see Pacinian corpuscle
 Velocity, conduction, 49
 Vibrator, 65, 242, 243, 244
 Von Recklinghausen's disease, 100
 Whale, 32

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